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ABSTRACT

This study of predictive validities of Academic Interest Measures (AIM) is based on a follow-up through Grade 12 and one year after high school graduation, of students tested in Grade 11. Major topics considered are: prediction of both marks and interests in Grades 12 and 13, emphasizing differential prediction; structure of abilities, interests and values; and relationships between the independent variables and occupational criteria for the subsample which did not continue post-high school education. (PR)

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THE MEASUREMENT OF ACADEMIC INTERESTS

Part II. The Predictive Validities of Academic Interest Measures

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TM 000 646

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THE MEASUREMENT OF ACADEMIC INTERESTS

Part II. The Predictive Validities of Academic Interest Measures

Abstract

This study of predictive validities of academic interest measures is based on a follow-up through grade 12 and one year after high school graduation of students who had been tested in grade 11. The report focuses on four major topics:

(1) the prediction of marks in grades 12 and 13, with special attention to differential prediction;

(2) the prediction of interests in grades 12 and 13, again emphasizing the contribution of academic interest measures to differential prediction;

(3) the structure of abilities, interests, and values;

(4) the relationships between the independent variables and occupational criteria for the subsample that did not continue in an educational institution during the year after graduation from high school.

Some incidental attention is also given to interest score profiles for various major-field and occupational groups. Another incidental analysis shows the proportions (classified by sex, socioeconomic status, and ability) of the students followed up after high school graduation who attended four-year or two-year colleges or did not go to college.

To assess the distinctive contribution to prediction made by the Academic Interest Measures (AIM), a consistent statistical procedure has been followed. Multiple correlations are given in a progression that always starts with Preliminary Scholastic Aptitude Test scores, Verbal

and Mathematical (PSAT-V and PSAT-M), as predictors; then variables from AIM and other predictors are added successively. A major obligation is undertaken to determine the extent to which AIM increases predictive validities when ability scores, and sometimes previous marks, are already available. Finally, the contribution of AIM is compared with that of a simpler rating by students of their own interests in the fields represented by AIM scales.

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THE MEASUREMENT OF ACADEMIC INTERESTS

Part II. The Predictive Validities of Academic Interest Measures[1]

INTRODUCTION

Part I of this report on the measurement of academic interests (Katz, Norris, and Halpern, 1970) summarized the procedures followed in developing the Academic Interest Measures (AIM); described the main study sample of 11th-grade students and the initial collection of data; presented AIM norms for grade 11 and discussed the distributions of scores; reported data on the reliabilities of scores; analyzed the structure of the scales; and gave evidence of the construct validity of AIM.

The students first tested in grade 11 were followed up through grade 12 and one year after high school graduation. This longitudinal study was undertaken primarily to assess the predictive validities of AIM. The present publication--Part II of the report--analyzes the follow-up studies as they bear on four major topics: (1) the prediction of marks in grades 12 and 13, with special attention to differential prediction; (2) the prediction of interests in grades 12 and 13, again emphasizing the contribution of AIM to differential prediction; (3) the structure of abilities, interests, and values; (4) the relationships between the independent variables and occupational criteria for the subsample that did not continue in an educational institution during the year after graduation from high school. Some incidental attention is also given to interest score profiles for various major-field and occupational groups. Another incidental analysis, reported in this Introduction, shows the proportions (classified by sex, socioeconomic status, and ability) of the students followed up after high school graduation who attended four-year or two-year colleges or did not go to college.

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[1] The authors are grateful to Robert Linn and Paul Diederich, who reviewed the draft of this report, for their helpful suggestions.

In all of the predictive validity studies, a crucial question has been posed about the incremental utility of AIM: Is there a simpler method of getting the same amount of useful information? In other words, does the open, straightforward array of activity descriptions that constitute AIM--16 items for each of 12 scales--contribute more relevant information than a very economical alternative: asking a student--once--how interested he is in the field represented by each scale?

As was reported in Part I, the correlations between the full AIM scales and the corresponding single rating of interest in a field tend to fall in the .40's (although the range is .38 to .72). In general, then, the AIM scales might be expected to provide information somewhat different from the single rating. Certainly, the scales must be much more reliable. The "payoff" question, however, remains: Is the difference relevant to the kinds of predictions that are to be made? To answer this question, the analyses in this report, whenever possible, pit AIM against the single ratings of interest. Although this kind of comparison is unusual, it seems necessary. Its importance is emphasized by Dolliver's recent review, indicating that even an instrument as widely respected and used as the Strong Vocational Interest Blank has not demonstrated predictive validity superior to expressed interests (Dolliver, 1969).

Our concern, however, has not been exclusively with the "payoff" of AIM as a predictive measure. In Part I, we referred to its possible virtues as a criterion measure. In this report, while analyzing data to assess the predictive validity of the instrument, we have also used the data derived from the instrument--along with other data--to enhance our understanding of the nature of interests. Thus, the report is not only about a specific instrument, but also about the domain of interests more generally construed.

The Major Variables

Scores were obtained from an abilities test and an interest inventory administered to the entire study population in 11th grade:

PSAT--a shortened version of the Scholastic Aptitude Test, yielding scores for verbal (PSAT-V) and mathematical (PSAT-M) abilities.

AIM--an interest inventory designed to assess interest in 12 subject fields that are commonly included in secondary school curricula: Biology (Bio), English (Eng), Art (Art), Mathematics (Math), Social Sciences (Soc Sci), Secretarial (Sec), Physical Sciences (P Sci), Foreign Languages (F Lang), Music (Mus), Industrial Arts (Ind Art), Home Economics (Home Ec), and Business (Bus). There are 16 items for each scale, making a total of 192. Students respond to the items, which designate activities representative of each field, by indicating "Like," "Indifferent," or "Dislike." Responses are scored 2, 1, and 0, respectively.

The following variables came from questionnaires taken by students during grades 11 and 12 and one year after high school graduation (copies of the questionnaires are provided in Appendix A):

SI--students' grade 11 ratings of interest in 12 subject field titles corresponding to the original AIM scale titles. These titles appeared on only one of the 20 forms (form D5) of the Student Questionnaire (items 9-20).

SI-1--students' grade 12 ratings of interest in 12 subject field titles corresponding to the revised AIM scale titles (items 25-36 of the Student Information Form).

SI-2--students' grade 13 ratings of interest in 12 subject field titles (items 20-31 of the College Questionnaire).

Grade 12 Marks--self-reported midyear marks in 12 subject fields corresponding to the AIM scales, on a 5-point scale from fail to excellent (items 12-23 of the Student Information Form).

Grade 13 Marks--self-reported midyear marks in 12 subject fields on a 5-point scale from fail to excellent (items 9-19 of the College Questionnaire).

Intended Major Field--plans at end of grade 13 (item 5 of the College Questionnaire).

Occupational Values--students' ratings, on a scale from 0 to 10, of the importance of 12 occupational values (items 92-103 of the College Questionnaire and items 41-52 of the "Tell It Like It Is" questionnaire).

Educational Goals--students' ratings, on a scale from 0 to 10, of the importance of seven educational goals (items 104-112 of the College Questionnaire and items 53-59 of the "Tell It Like It Is" questionnaire).

Occupational Interests--ratings, on a scale from 1 (most boring) to 4 (very interesting), of 12 groups of occupations by the nonschool-going sample (items 18-29 of the "Tell It Like It Is" questionnaire).

Job Satisfaction--ratings, on a scale from 1 (very dissatisfied) to 4 (very satisfied), of nine job aspects, by the nonschool-going sample (items 32-40 of the "Tell It Like It Is" questionnaire).

The Samples

It should be noted that the data treated in this report are based on follow-up questionnaires returned by three subsamples of the original population of 11th-graders tested in the fall of 1966. One is the five per cent random sample who had received the form (D5) of the 11th-grade Student Questionnaire that asked students to rate their interests in subject fields corresponding to the titles then used for AIM scales. The members of this subsample who completed the Student Information Form in grade 12 provided the basis for computing all validities for predicting grade 12 criteria.

Differences between this subsample and the total grade 11 sample would be expected to result from dropout and other nonrandom losses (totaling about 18 per cent) in the interval between the 11th-grade testing, in fall of 1966, and completion of the 12th-grade Student Information Form, in spring of 1968. Comparisons between the two samples in Table 1, however, show only minor differences in means (columns 1 and 3 for males, 7 and 9 for females) and standard deviations (columns 2 and 4 for males, 8 and 10 for females). Means of the two groups do not differ by more than 1.1 points on any AIM scale; PSAT means for the males are almost identical in the two samples; for the females, PSAT-V means differ by only 1.5 points, and PSAT-M by 1.9 in favor of the five per cent sample; means on socioeconomic status are identical. Thus, the grade 12 follow-up of the 11th-grade five per cent subsample seems to be reasonably representative of the original national sample of 11th-graders.

Insert Table 1 about here

Table 1

AIM, PSAT, and SES Means and Standard Deviations for Three Samples

	MALES						FEMALES					
	5% Sample in Grade 12		Total Grade 11 Sample		Combined Grade 13 and Nonschool-going		5% Sample in Grade 12		Total Grade 11 Sample		Combined Grade 13 and Nonschool-going	
	(1) Mean	(2) S.D.	(3) Mean	(4) S.D.	(5) Mean	(6) S.D.	(7) Mean	(8) S.D.	(9) Mean	(10) S.D.	(11) Mean	(12) S.D.
AIM Bio	17.2	8.2	17.3	8.5	18.1	8.5	16.2	8.5	15.6	8.4	16.1	8.6
Eng	14.2	8.1	13.3	8.1	14.5	8.3	18.9	7.7	18.5	8.0	19.5	7.9
Art	15.1	7.9	14.9	8.1	14.5	7.9	19.3	7.9	19.7	8.0	20.0	8.2
Math	16.9	9.3	16.8	9.6	19.5	9.4	13.9	9.8	12.8	9.4	14.2	9.8
Soc Sci	18.0	9.1	17.0	9.1	18.4	9.0	17.5	8.8	16.8	9.0	17.6	9.1
Sec	16.2	7.3	16.1	7.5	15.8	7.5	21.9	8.6	22.5	8.3	21.2	8.8
P Sci	19.9	8.8	19.8	9.0	21.2	8.6	12.7	9.1	11.6	9.0	12.6	9.1
F Lang	15.1	10.0	14.8	10.1	15.8	10.0	20.7	9.6	20.6	9.7	21.9	9.2
Mus	14.3	9.0	13.4	8.9	13.8	9.0	16.4	8.9	16.4	8.6	17.2	8.6
Ind Art	22.5	8.0	22.5	7.9	22.2	8.2	10.7	7.7	11.0	8.0	11.3	8.1
Home Ec	12.6	7.3	12.7	7.4	12.6	7.3	25.5	6.3	25.3	6.4	24.9	6.4
Bus	18.2	7.6	18.1	8.1	18.5	7.8	18.5	7.2	18.7	7.4	18.1	7.3
PSAT-V	35.6	11.5	35.5	11.7	40.6	12.0	37.3	11.2	35.8	10.9	39.5	11.1
PSAT-M	39.3	11.7	39.2	12.0	45.3	12.5	38.2	11.0	36.3	10.4	39.9	11.0
SES	3.0	1.4	3.0	1.3	3.2	1.3	3.0	1.4	3.0	1.3	3.1	1.3

The second subsample was derived from the members of the 11th-grade study population who were later identified as enrollees in post-secondary educational institutions. Those who completed the College Questionnaire provided the data for predicting "grade 13" criteria.

The third subsample was derived from the members of the 11th-grade study population who were later identified as nonschool-going in the year after high school graduation. Those who completed the "Tell It Like It Is" questionnaire provided data for the occupational criteria, such as job fields entered and preferred, occupational interests and satisfaction, and the like.

Pooling all cases from these latter two subsamples--the school-going and nonschool-going--permits a comparison between the entire one-year-after high-school follow-up sample and the original total grade 11 sample (Table 1). Looking at columns 3 and 5 for males, 9 and 11 for females, we find again very slight differences in AIM scale means, with the exception of Mathematics for the males (2.7). PSAT means are, as usual in follow-up studies, consistently higher for the students who completed questionnaires one year after high school graduation than for the original 11th-grade sample. Curiously, PSAT standard deviations also tend to be a little higher for this follow-up group. SES means for the follow-up group are also slightly higher, although standard deviations are identical.

It is to be expected that the second and third subsamples mentioned--the school-going and nonschool-going groups--would differ appreciably on most variables measured in grade 11. As Table 2 and Figure 1 indicate, the school-going group is higher in AIM scales that represent the academic fields and lower only in such nonacademic fields as Secretarial, Home

Economics, and (for the males) Industrial Arts. The school-going group has appreciably higher PSAT and SES means and standard deviations than the nonschool-going. Comparisons of these standard deviations with standard deviations of the original 11th-grade national sample show that it is the nonschool-going sample--much more than the school-going sample--that is restricted in range.

Insert Table 2 and Figure 1 about here

In longitudinal studies, it is often enlightening to trace the attrition of the sample over a period of years. Even when one starts with almost 20,000 11th-graders, one is likely to encounter insufficient numbers for analysis in some college freshman courses. Figure 2 tracks the original sample through successive stages of response. Letters in the figure are keyed to the summary of the follow-up procedures below.

Follow-up procedures. PSAT, AIM, and the Student Questionnaire were administered in fall 1966 to (A) 19,612 students representing a national sample of 11th-graders in public and private schools.

These students were questioned as 12th-graders in May 1968 about their future educational plans. Returns were received from (B) 14,162, or 72 per cent of the original sample. Of the remainder, (C) 2150, or 11 per cent of the original sample, were identified by their schools as dropouts. The rest of the original sample must be identified primarily as untraced migrants: that is, although names of schools to which students had transferred during this interval were systematically obtained, and many of these students were reached at their new schools, (D) 3300, or 17 per cent of the original sample, were lost between the 11th-grade fall 1966 testing and the 12th-grade May 1968 follow-up.

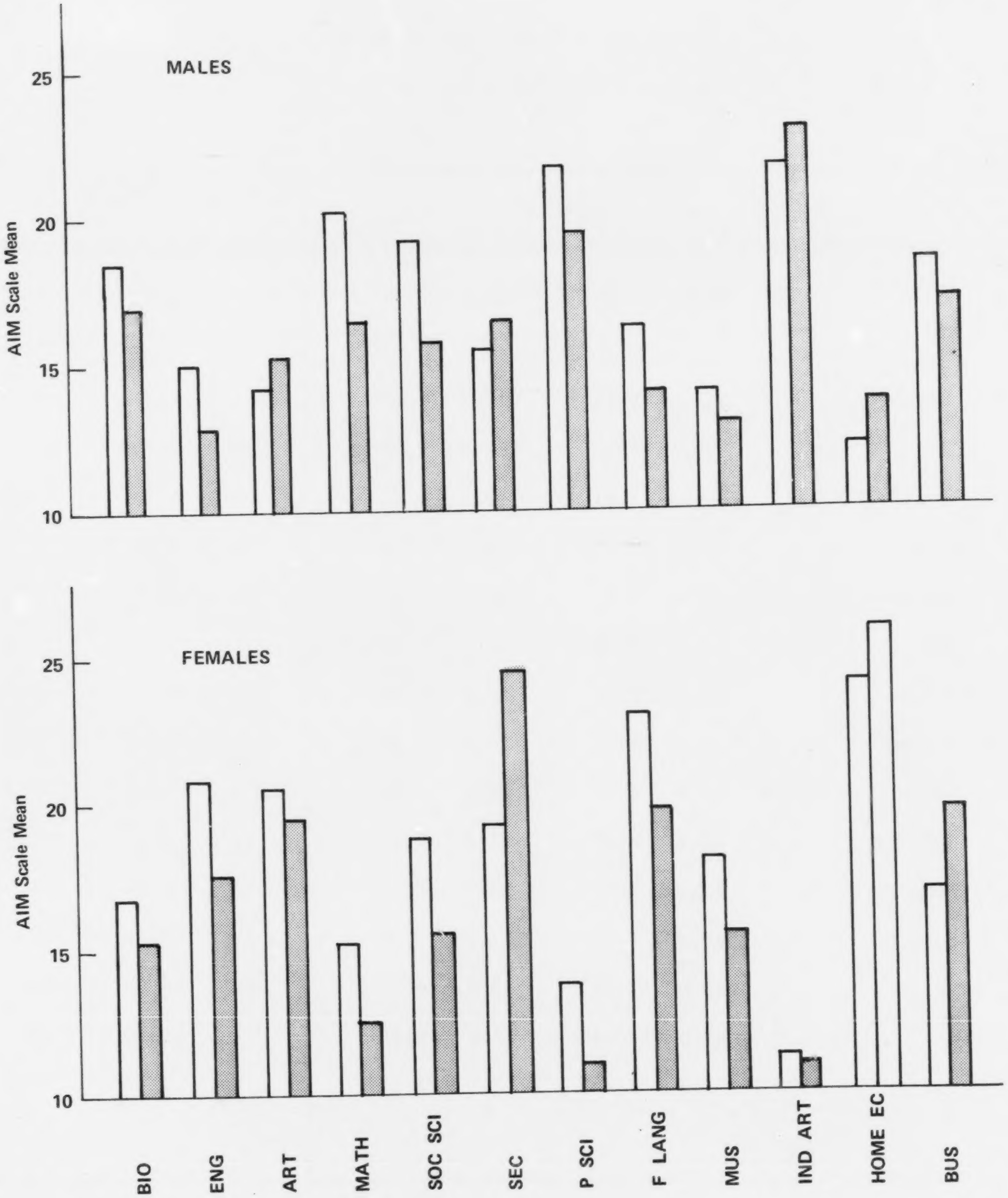
Table 2

Comparisons between Two Subsamples One Year after High School Graduation

	MALES				FEMALES			
	School-going (N=1694)		Nonschool-going (N = 634)		School-going (N=2375)		Nonschool-going (N=1348)	
	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.
AIM Bio	18.4	8.41	17.2	8.46	16.8	8.70	15.2	8.27
Eng	15.0	8.31	12.8	8.08	20.7	7.44	17.4	8.16
Art	14.2	7.81	15.2	8.12	20.4	8.09	19.4	8.19
Math	20.3	9.13	16.5	9.44	15.2	9.90	12.6	9.26
Soc Sci	19.2	8.90	15.7	8.67	18.8	8.85	15.6	9.14
Sec	15.6	7.42	16.4	7.44	19.3	8.82	24.5	7.62
P Sci	21.7	8.55	19.5	8.69	13.7	9.23	10.9	8.76
F Lang	16.2	9.76	14.1	10.33	23.0	8.55	19.7	9.96
Mus	14.0	8.93	13.0	8.93	18.1	8.45	15.4	8.59
Ind Art	21.8	8.32	23.0	7.58	11.5	8.23	11.1	8.08
Home Ec	12.2	7.02	13.7	7.64	24.3	6.50	25.9	6.11
Bus	18.8	7.65	17.3	7.90	17.1	7.12	19.7	7.39
PSAT-V	43.0	11.33	33.0	10.33	43.1	10.75	34.0	9.07
PSAT-M	48.0	11.54	37.0	10.88	43.3	10.80	34.3	8.93
SES	3.4	1.25	2.7	1.17	3.5	1.28	2.5	1.18

Figure 1

AIM Scale Means for School-going and Nonschool-going Samples



☐ = School-going Sample
▨ = Nonschool-going Sample

Insert Figure 2 about here

In late summer 1968, return postcards were sent to parents of the (B) 14,162 students who had responded to the May 1968 questionnaire. These parents were asked to indicate the students' educational plans for the academic term about to begin. During the fall 1968 semester, every school or college named by a student in May 1968 and/or by a parent in late summer 1968 was sent a roster of students from the study who were presumed to be possible enrollees in that institution. The institution was asked to verify the enrollment of each student on the roster.

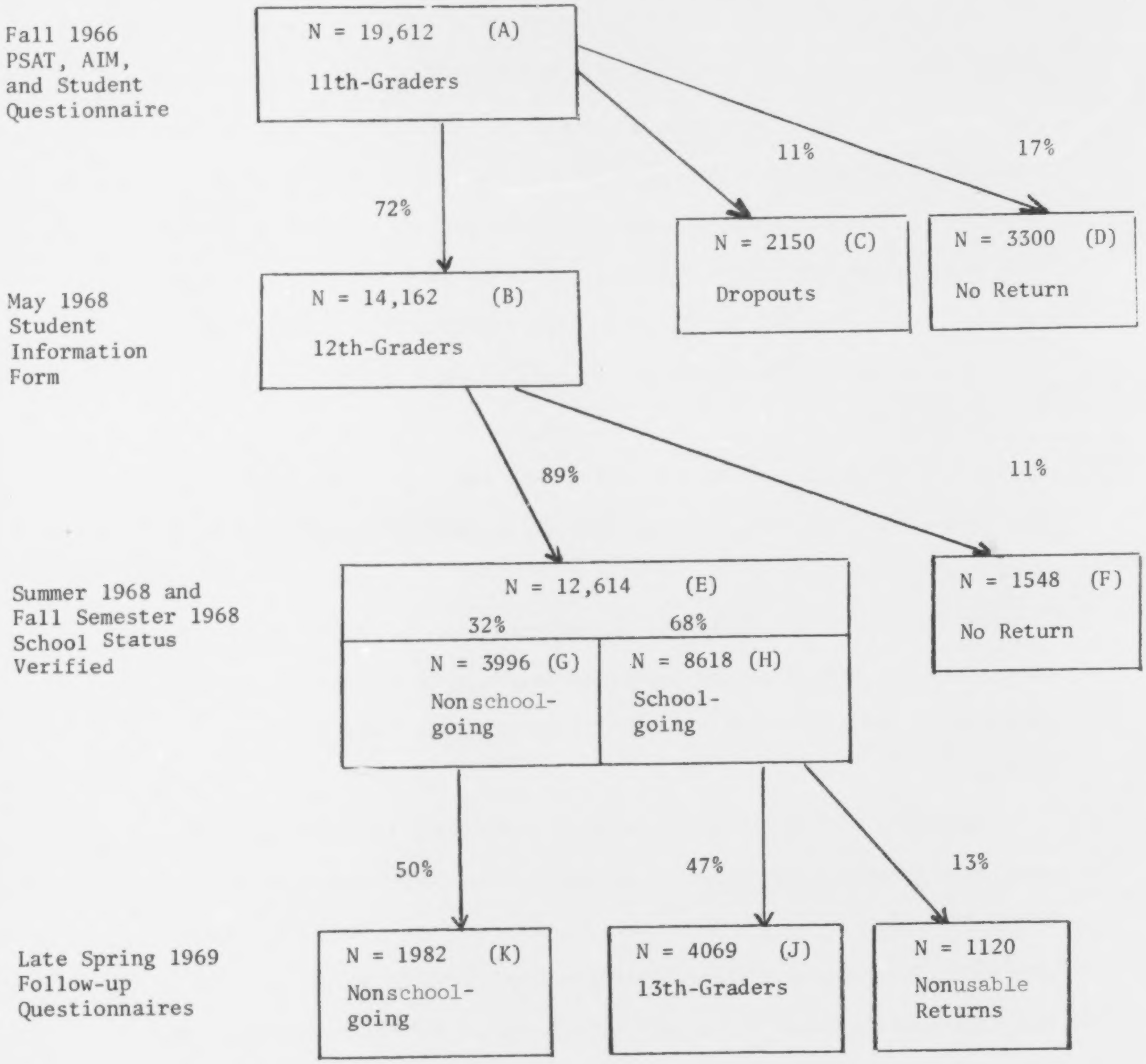
These verifications of post-secondary school status produced a return (E) of 12,614, or 89 per cent of the May 1968 12th-graders (B). The 12th-graders who could not be traced comprised (F) 1548, or 11 per cent.

Of the (E) 12,614 whose status was verified, (G) 3996, or 32 per cent, were not attending any post-secondary school or college, and (H) 8618, or 68 per cent, were enrolled in educational institutions as defined.

These (H) 8618 whose post-secondary enrollment had been verified were sent lengthy questionnaires in late spring 1969, near the end of grade 13. Usable replies were received from (J) 4069, or 47 per cent of these 13th-grade enrollees. Returns from 1120, or 13 per cent of the 13th-graders, were incomplete or not usable for other reasons. The (G) 3996 who were not attending any post-secondary school were sent questionnaires in the late spring 1969, approximately one year after graduating from high school. Returns were received from (K) 1982, or 50 per cent of these graduates.

Figure 2

Attrition of Sample


Fall 1966
PSAT, AIM,
and Student
Questionnaire
N = 19,612 (A)
11th-Graders
72%
11%
17%
N = 2150 (C)
Dropouts
N = 3300 (D)
No Return
May 1968
Student
Information
Form
N = 14,162 (B)
12th-Graders
89%
11%
Summer 1968 and
Fall Semester 1968
School Status
Verified
N = 12,614 (E)
32%
68%
N = 3996 (G)
Nonschool-
going
N = 8618 (H)
School-
going
N = 1548 (F)
No Return
50%
47%
13%
Late Spring 1969
Follow-up
Questionnaires
N = 1982 (K)
Nonschool-
going
N = 4069 (J)
13th-Graders
N = 1120
Nonusable
Returns

Thus, the original 19,612 tested in grade 11 dwindled to 6051 (4069 + 1982) one year after high school graduation.

Ability, Socioeconomic Status, and Post-secondary Education

The present study was not designed to survey trends in attendance at post-secondary educational institutions. Considerable interest has been expressed, however, in the extent to which high school graduates at various levels of ability and socioeconomic status (SES) continue with their formal education in the year after their graduation. Some of this interest stems from questions about the impact of the growth of junior colleges and of programs of financial aid and recruitment for higher education during the 60's.

A recent report (Schoenfeldt, 1968) on students who were tested in Project TALENT as high school juniors in 1960 and later followed up divided the distributions of scores on an ability composite and an SES index, separately by sex, at their respective quartiles. The students were then classified into the resulting 16 cells, and the proportion of students in each cell who were members of each of six criterion groups in the year after high school graduation was computed.

To invite direct comparisons with those findings, the present study--based on a similar sample six years later--has cast Tables 3 and 4 in the same mold as those published by Schoenfeldt. A few cautions should nevertheless be sounded before such comparisons are made. The many differences between the two studies in measures, procedures, and the like warrant interpretation of only very gross differences. To avoid an extended digression from the main focus of this study, point-by-point comparisons between the methods of the two studies will not be made.

Instead, we content ourselves with defining as precisely as possible our own procedures, and leave the judgments of comparability to those who are interested.

The basis of the sample, the instruments used, the follow-up design, and the response rates have already been described. Scores on PSAT-V were used as measures of ability. The index of SES was derived by combining father's occupational level and mother's educational level, as indicated by students on the 11th-grade questionnaire (Katz, Norris, and Halpern, 1970). Within each cell representing a given combination of ability and SES, enrollees in "grade 13" were classified according to type of institution, such as four-year college, two-year college, technical institute, business school, and nursing school.

With reference again to Figure 2, distributions of nonenrollees according to PSAT-V and SES are based on all of the (G) 3996 students who did not attend a post-secondary institution. Although questionnaires were also sent to these students, their replies are not germane here since no further classification is required. However, since the number of enrollees within each PSAT-SES cell represents only 47 per cent (J) of the total verified post-secondary enrollments (H), the number of nonenrollees in each PSAT-SES cell must be reduced to a comparable basis. Therefore, after the (G) 3996 had been separated by sex and distributed into the appropriate PSAT-SES cells, 47 per cent of the number within each cell was taken as the appropriate number for comparison with enrollees (J).

For example, the (J) 4069 13th-grade enrollees included 1694 males. Of these 1694 13th-grade male enrollees, 117 fell into the cell representing the second quarter on PSAT and the second quarter on SES (Table 3). Of the males in this cell, 48 were in four-year colleges, 46 in two-year colleges, and 23 in other schools. Of the (G) 3996 nonenrollees, 1799 were males. Of these, 191 fell into the same second quarter on PSAT and second quarter on SES. Taking 47 per cent of this number yields 90 male nonenrollees in this cell. The sum of the number of males in this cell is thus 207. Proportions of this sum are represented by the percentages in the corresponding cell in Table 3.

Insert Tables 3 and 4 about here

On the whole, the findings from the present sample seem quite compatible with the Project TALENT findings. Taking into account differences in sample, research strategies, SES and ability measures, and time, closer agreement between the two sets of findings would be surprising.

The major differences worth noting are, first of all, a general increase in post-secondary enrollment, particularly in junior colleges. This is of course to be expected in view of the rapid growth of junior colleges during the years between the TALENT study and this one. In addition, major increases in enrollment at four-year colleges occur in the lowest SES quarter. For example, the earlier study shows 42 per cent of the highest ability-lowest SES males in four-year colleges, compared to 65 per cent in the present study. For the females, the corresponding figures are 36 per cent and 57 per cent, respectively.

For the males, the proportions of enrollees in the highest SES group, at every ability level, are quite similar across the two studies. The present study, however, shows higher proportions of high SES-low ability female enrollees.

Table 3

Percentages of 12th-Grade Males Classified by SES, Ability, and 13th-Grade Enrollment

First (Lowest) Socioeconomic Quarter

	Ability Quarter			
	1st (Low)	2nd	3rd	4th (High)
Four-year college	7.1	17.2	32.6	65.3
Junior college	7.1	11.7	15.3	9.6
Technical school	2.6	3.4	2.0	1.9
Trade school	.6	1.4	1.0	0
Armed Forces school	.6	.7	1.0	0
Other	6.5	4.8	6.1	3.8
None	75.3	60.6	42.8	19.2

Second Socioeconomic Quarter

	Ability Quarter			
	1st (Low)	2nd	3rd	4th (High)
Four-year college	7.8	22.8	37.6	64.8
Junior college	10.4	21.8	19.5	13.7
Technical school	3.5	3.7	6.0	1.9
Trade school	.9	2.1	0	0
Armed Forces school	0	1.6	0	2.8
Other	1.7	4.8	4.7	.9
None	75.6	43.0	32.2	16.6

Third Socioeconomic Quarter

	Ability Quarter			
	1st (Low)	2nd	3rd	4th (High)
Four-year college	15.7	18.6	29.9	74.3
Junior college	17.2	28.4	31.5	11.4
Technical school	4.3	3.9	1.6	.4
Trade school	2.9	0	1.6	0
Armed Forces school	1.4	0	2.4	1.1
Other	7.2	5.9	5.5	1.4
None	51.5	43.1	27.5	11.4

Fourth (Highest) Socioeconomic Quarter

	Ability Quarter			
	1st (Low)	2nd	3rd	4th (High)
Four-year college	28.0	38.3	52.3	81.4
Junior college	12.0	23.8	17.4	6.5
Technical school	0	4.0	3.2	.3
Trade school	4.0	0	1.6	.3
Armed Forces school	0	1.3	2.4	1.8
Other	0	5.3	5.6	1.8
None	56.0	27.2	17.4	7.7

Table 4

Percentages of 12th-Grade Females Classified

by SES, Ability, and 13th-Grade Enrollment

First (Lowest) Socioeconomic Quarter

	Ability Quarter			
	1st (Low)	2nd	3rd	4th (High)
Four-year college	9.4	14.1	27.1	57.4
Junior college	7.2	11.2	13.6	9.4
Nursing school	2.9	1.2	4.3	3.4
Secretarial or business	3.6	6.5	5.0	1.4
Technical school	.7	0	2.9	.7
Other	13.8	8.8	11.4	5.4
None	62.3	58.2	35.7	22.3

Second Socioeconomic Quarter

	Ability Quarter			
	1st (Low)	2nd	3rd	4th (High)
Four-year college	8.8	14.0	33.5	56.3
Junior college	7.6	15.0	17.9	14.3
Nursing school	1.2	4.1	4.5	6.3
Secretarial or business	7.6	4.7	3.3	.8
Technical school	1.2	.5	2.2	2.1
Other	8.8	13.0	7.8	4.2
None	64.3	48.7	30.7	16.0

Third Socioeconomic Quarter

	Ability Quarter			
	1st (Low)	2nd	3rd	4th (High)
Four-year college	10.8	30.3	49.5	67.3
Junior college	18.5	18.2	17.1	12.0
Nursing school	3.1	4.2	5.4	3.3
Secretarial or business	3.1	3.0	1.2	1.5
Technical school	1.5	.6	.8	1.2
Other	9.2	7.3	5.4	1.2
None	53.9	36.4	20.4	13.5

Fourth (Highest) Socioeconomic Quarter

	Ability Quarter			
	1st (Low)	2nd	3rd	4th (High)
Four-year college	42.0	47.4	59.2	79.3
Junior college	12.9	18.5	17.4	8.2
Nursing school	6.5	2.1	3.8	3.2
Secretarial or business	0	4.1	3.3	.7
Technical school	0	0	0	0
Other	0	6.2	4.9	2.1
None	38.8	21.6	11.4	6.4

Another element in patterns of enrollment in higher education may be noted. As detailed in a later section (Table IV-1), over half of the respondents who were not enrolled in formal post-secondary education during the first year after graduation from high school did plan to enroll during the following year, mostly in four-year or two-year colleges. Despite the great increase in immediate college attendance among low SES groups, there is evidence that financial matters still exercise some effect in delaying enrollments. For example, differences are found between the enrollees and those who have postponed enrollment until the following year in responses to a question about sources of financial support for post-secondary education. For example, a higher proportion of those enrolled in grade 13 depend on family as a major source of support. A higher proportion of those who were postponing their enrollment look to "Working while attending school." Table 5 shows the detailed responses by those enrolled in grade 13. (Responses by those not enrolled during the first year after graduation from high school appear in Table IV-2).

Insert Table 5 about here

• Since this information is incidental to the main purpose of the study, no further analysis or discussion seems appropriate here. A separate study by Haven and Horch is now under way, however, using the same sample of college enrollees at the end of their sophomore year to investigate current college costs and ways in which students are financing their education, with special attention to ways in which race, SES, and type of college relate to sources of support.

Table 5

Source of Financial Support (Grade 13 Sample)

Source of Financial Support	% Contribution	%M	%F
Parents, wife or husband, other relatives	90 - 100	28	41
	80 - 89	7	8
	70 - 79	5	5
	60 - 69	4	4
	50 - 59	7	6
	40 - 49	4	4
	30 - 39	6	4
	20 - 29	6	5
	10 - 19	13	10
	0 - 9	20	13
Working while attending school	20 - 100	21	13
	10 - 19	17	15
	0 - 9	62	72
Personal savings	20 - 100	34	18
	10 - 19	18	19
	0 - 9	48	63
Scholarships or grants from school attended	10 - 100	20	19
	0 - 9	80	81
Scholarships or grants from other sources	10 - 100	17	18
	0 - 9	83	82
Loans from the National Defense Education Act Loan Fund	10 - 100	11	11
	0 - 9	89	89
Loans from college loan funds	10 - 100	2	3
	0 - 9	98	97
Loan banks or other organizations	10 - 100	6	8
	0 - 9	94	92
GI Bill, ROTC, or other government assistance	10 - 100	4	4
	0 - 9	96	96
Trust fund, insurance plan	10 - 100	2	2
	0 - 9	98	98

I. THE PREDICTION OF MARKS

Traditionally, studies of academic success have concentrated on the prediction of grade point average (GPA) from aptitude and achievement measures and, more recently, from nonintellective measures as well. A recent survey of studies made by the College Board Validity Study Service shows validity coefficients ranging from .25 to .75 in various institutions (Schrader, 1971). Lavin's (1965) review of the literature reports that correlations average about .65.

The use of grade point average as a criterion has some serious limitations, for like any global measure it is often of little value when decisions involving discriminations between course fields are required. This point was brought out by Horst (1957) in a plea for college admissions based on differential rather than overall predictions, as well as by others (French, 1954; Fricke, 1965).

Studies in the realm of differential prediction, i.e., the prediction of differences between criteria, are relatively scarce. This scarcity is largely attributable to the host of problems associated with differential prediction (Wesman and Bennett, 1951). Such problems range from the unavailability of an adequate sample size to the lack of complete data (Kelleher, 1969).

Despite these difficulties, several recent studies have reported predictions for specific grades, and these findings seem to indicate that specific course marks are somewhat less predictable than GPA. At the high school level, for example, French (1964) reports validities generally in the .40's using a battery of aptitude, information, and personality tests. At the college level, validities in the .50's are reported for grades in a variety of introductory college courses predicted from ability and achievement measures (Washington Pre-College Testing Program). Slightly lower correlations are reported for first semester marks in English and in mathematics at community colleges (Ford, 1970). Correlations of four subject area tests with first semester grades in corresponding fields are found to range from .38 for mathematics to .47 for English (Cole, 1969). In an earlier study, French (1961), using a battery consisting of aptitude, personality, and interest measures (half length interest scales which were the forerunners of AIM), found validities for college freshman grades in the range of .33 for mathematics to .41 for biology.

Differential validities, expressed as correlations between actual and predicted criterion differences, indicate whether predictions comparing success in two fields are justified. Such validities, when reported (Cole, 1969; French, 1954), are generally found to be in the .20's and .30's.

As pointed out by Lavin (1965), findings regarding differential prediction are inconsistent. Furthermore, the incremental utility derived from developing differential test batteries is often not brought out in studies because comparisons with a uniform test battery are not made.

In general, our attempts to assess the contribution of AIM to prediction of marks in various courses will consider these successive questions at each grade level:

(1) What are the zero-order correlations between AIM scores and appropriate course marks?

(2) How much does AIM add to the multiple correlations when PSAT scores (and sometimes previous marks) are available as predictors?

(3) Does the contribution of AIM to prediction exceed that of student-rated interest in each field represented by an AIM scale?

The contributions of AIM and of student-rated interests to _differential_ prediction will then be considered.

In all of these analyses, the criterion measures--marks--are pooled across all schools. The marks were not obtained from official records but were reported by the students themselves. Several recent studies (Baird, 1969; Kirk and Sereda, 1969; Richards and Lutz, 1968) show that correlations between actual and self-reported grades tend to fall in the .80's and .90's. Thus their reliabilities and the predictive validity coefficients would presumably be lower than in most studies using marks within one institution as the criteria.

Prediction of Grade 12 Marks

Intercorrelations, means and standard deviations for grade 12 marks are given in Table I-1. In reporting marks, students used a five-point scale from 1 (F, Fail) to 5 (A, Excellent).

Insert Table I-1 about here

Because of a rather small sample size (N = 749), some of the criterion pairs contained fewer than 50 students and were therefore omitted in the table of intercorrelations. The correlations reported are generally in the range .4 to .5. For the females, a rather high correlation is noted between marks in biological science and social studies (.73).

Higher course mark means are evidenced for the females than for the males in all subject fields. The difference in means ranges from .1

Table I-1

Intercorrelations, Means and Standard Deviations for Grade 12 Marks[a]

	English	Foreign Language	Mathematics	Biological Science	Physics/Chemistry	Social Studies/ History/Geography	Music	Art	Industrial Arts	Secretarial Courses	Home Economics	Bookkeeping/ Accounting	Mean	S.D.	(N)
English		.53	.39	.41	.44	.59	.23	.56	*	.52	.46	.36	3.8	.84	(324)
Foreign Language	.52		.54	.45	.60	.44	*	*	*	.32	*	*	4.0	.93	(127)
Mathematics	.29	.40		.47	.52	.42	.28	*	*	.39	.30	*	3.6	1.08	(161)
Biological Science	.36	.43	.52		*	.73	*	*	*	.43	*	*	3.7	1.03	(88)
Physics/Chemistry	.39	.51	.42	.54		.51	*	*	*	*	*	*	3.7	.97	(83)
Social Studies/History/ Geography	.50	.55	.37	.51	.50		.30	.51	*	.43	.40	.44	3.8	.96	(265)
Music	.29	*	.20	*	*	.30		*	*	*	*	*	4.4	.78	(92)
Art	.13	*	*	*	*	.30	*		*	*	*	*	3.9	.98	(66)
Industrial Arts	.26	*	.24	.21	*	.17	*	*		*	*	*	3.9	1.00	(14)
Secretarial Courses	*	*	*	*	*	*	*	*	*		.58	.63	4.0	.87	(170)
Home Economics	*	*	*	*	*	*	*	*	*	*		*	4.0	.82	(109)
Bookkeeping/Accounting	.41	*	*	*	*	.44	*	*	*	*	*		3.8	1.03	(72)
Means	3.3	3.3	3.4	3.4	3.6	3.5	4.1	3.7	3.8	3.4	3.2	3.5			
S.D.	.91	1.08	1.04	1.07	1.09	.96	1.10	.81	.91	.99	1.03	1.14			
(N)	(333)	(115)	(222)	(113)	(138)	(259)	(82)	(60)	(124)	(144)	(17)	(60)			

*N < 50

[a] Males below the diagonal; females above.

(physics or chemistry) to .8 (home economics). The highest mean for both sexes is in the field of music.

To assess the contribution of AIM to the prediction of high school marks in the first semester of grade 12, correlations were first computed between 12th-grade marks and 11th-grade measures of scholastic abilities (PSAT) and of interests (AIM) for a randomly selected five per cent sample of the study population. Table I-2 presents these correlations. They are not corrected for any restriction in the range of scores obtained by students who were enrolled in each subject. As it happens, substantial restrictions are found in PSAT variances for males enrolled in art and in bookkeeping or accounting, and for females in secretarial courses, home economics, and bookkeeping or accounting. Restrictions in variances of appropriate AIM scales are found for males enrolled in physics or chemistry and in industrial arts and for females enrolled in foreign language and in bookkeeping or accounting. To illustrate the effects of restriction, a correction was computed for the correlation between 11th-grade AIM and 12th-grade marks in industrial arts.[2] For males, this correction for restriction of range raises the correlation from .21 to .25.

Insert Table I-2 about here

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[2] See J. P. Guilford, Fundamental Statistics in Psychology and Education, pp. 341-348, for discussion of corrections for restriction of range. The formula used to compute correlation corrected for restriction of range is

$$rc = \frac{rS1/S2}{\sqrt{1 - r^2 + r^2(S1^2/S2^2)}} ,$$

where r_c is the estimated correlation for the unrestricted group
r is the correlation for the restricted group
S1 is the standard deviation in the unrestricted group
S2 is the standard deviation in the restricted group.

Table I-2

Correlations of 11th-Grade PSAT-V, PSAT-M, and AIM Scale[a]

with 12th-Grade Course Marks

Course	PSAT-V		PSAT-M		Similarly Titled AIM Scale	
	M	F	M	F	M	F
Biological Science	.40	.55	.36	.50	.32	.02
English	.43	.49	.43	.49	.21	.15
Art	.18	.51	.09	.35	.29	.00
Mathematics	.22	.38	.38	.49	.22	.42
Social Studies/History/ Geography	.41	.49	.41	.46	.34	.30
Secretarial Courses	--	.33	--	.42	--	.02
Physics/Chemistry	.36	.34	.41	.56	.12	.06
Foreign Language	.25	.48	.31	.57	.25	.30
Music	.28	.40	.26	.38	.45	.13
Industrial Arts	.33	--	.32	--	.21	--
Home Economics	--	.35	--	.35	--	.13
Bookkeeping/Accounting	.50	.39	.39	.53	.27	.17

[a] Only correlations with similarly titled AIM scales are included in this table. In a few cases another AIM scale had a higher correlation.

Correlations between PSAT-V or M and 12th-grade course marks are typically on the order of .3 to .4 for males, and .4 to .5 for females. Correlations between course marks and corresponding AIM scales are generally somewhat lower for males and considerably lower for females. For males, there are two noteworthy exceptions--art and music. For females, only mathematics marks have about as high a correlation with interest as with abilities. Findings like these have often been interpreted as suggesting that, aside from mathematics, high school girls tend to achieve at a level more consistent with their abilities than boys do, regardless of interests. The achievement of boys, on the other hand, does reflect their interest to a greater extent.

These general findings, i.e., the superiority of ability tests over other measures in predicting school achievement, particularly for females, are consistent with findings in the literature (Lavin, 1965; Seashore, 1962; Thomas and Stanley, 1969).

More directly relevant to the increment in predictive validity afforded by AIM are the multiple correlation coefficients in Table I-3. The columns headed R1.23 give the multiple correlations for predicting grade 12 course marks from abilities (PSAT-V and PSAT-M) alone; the columns headed R1.234 include the grade 11 similarly titled AIM scale among the predictors for each field. These data provide few general statements of relationships that apply across academic fields for both sexes. The following two generalizations, however, do seem clear:

1. Grade 12 course marks are more predictable for females than for males. Music marks provide the one conspicuous exception.

2. Interests play a greater role in the prediction of 12th-grade marks for males than they do for females. The one exception is in the field of mathematics.

Turning now to specifics, first for the boys, then for the girls, we note the following points. For boys:

1. Four of the 10 course marks are predicted with multiple R's equal to or greater than .50 (bookkeeping/accounting, music, biological science, social studies/history/geography).
2. In each of these four subject fields, AIM provides a significant contribution to the prediction of grades over an ability measure.
3. In three of the remaining six fields (art, foreign language, industrial arts), AIM provides a significant increase in the multiple R.

Insert Table I-3 about here

For girls:

1. Eight of the 11 course marks are predicted with a multiple R equal to or greater than .50 (foreign language, bookkeeping/accounting, physics/chemistry, biological science, mathematics, social studies/history/geography, English, art).
2. Of these eight subject fields, AIM's contribution to the prediction of marks over an ability measure is significant in only two instances (mathematics and bookkeeping/accounting).
3. In two of the remaining three fields (secretarial courses and home economics), AIM contributes significantly to the multiple R.

Table I-3

Multiple Correlations for Predicting 12th-Grade Course Marks (1)

from 11th-Grade PSAT-V (2), PSAT-M (3), AIM (4), and SI (5)

12th-Grade Mark (1)	MALES				FEMALES			
	R1.23	R1.234	R1.235	R1.2345	R1.23	R1.234	R1.235	R1.2345
Biological Science	.41	.51	.47	.52	.56	.57	.57	.57
English	.46	.47	.49	.49	.53	.53	.54	.54
Art	.19	.36	.31	.38	.51	.52	.53	.53
Mathematics	.39	.40	.41	.41	.49	.57	.58	.59
Social Studies/History/ Geography	.44	.51	.46	.51	.51	.54	.55	.56
Secretarial Courses	*	*	*	*	.42	.47	.43	.45
Physics/Chemistry	.41	.42	.41	.42	.57	.58	.57	.58
Foreign Language	.31	.36	.39	.39	.57	.59	.58	.58
Music	.29	.53	.56	.59	.42	.42	.44	.44
Industrial Arts	.34	.43	.39	.44	*	*	*	*
Home Economics	*	*	*	*	.38	.43	.46	.47
Bookkeeping/Accounting	.50	.57	.51	.58	.53	.58	.55	.59

*N < 50

It is clear from these findings that there is interaction among academic interests and sex and subject field. Thus, in predicting grade 12 marks for boys, AIM scales seem to make their most conspicuous contribution in music, art, and biology--subjects in which they contribute nothing to prediction for girls. The evidence that interest in mathematics makes a distinctive contribution to the prediction of girls' (but not boys') marks in mathematics is consistent with the factor analysis of PSAT and AIM discussed in Part I of this report (Katz, Norris, and Halpern, 1970). It will be recalled that the structure of interests and abilities generally holds similar for boys and girls, but that mathematical interest appears as a factor separate from mathematical ability only for the girls.

These data on the contribution of AIM to prediction of 12th-grade marks leave two major questions unanswered. One, recognizing the transparency of the AIM items and scales, may be posed as follows: Are these 16-item scales necessary, or can one gain as much in predictive validity by just asking the student, once, about his interest in each field? Since the five per cent random sample of 11th-graders used for this analysis did indeed rate their interests in this way, this question can be answered. The column headed R1.235 in Table I-3 gives the multiple correlations for predicting grade 12 course marks from PSAT-V and PSAT-M and self-rated interest in a similarly titled field (SI). These correlations are seen to be of the same general magnitude as those in the preceding column which are based on AIM. In other words, self-ratings turn out to be as valid, in most instances, as full AIM scales in predicting 12th-grade marks.

The last column in Table I-3, headed R1.2345, gives multiple correlations using PSAT-V, PSAT-M, and both AIM and self-rated interest as predictors. Comparing this column with the column headed R1.235 provides an evaluation of the predictive power of AIM beyond that of PSAT and SI.

For the females, AIM's contribution is negligible; for the males, AIM's contribution to the multiple correlation for 12th-grade marks over that given by PSAT and SI is equal to or greater than .05 in five of the 10 reported fields (biological science, art, social studies/history/geography, industrial arts, and bookkeeping/accounting).

The other question concerns the incremental validity of AIM when previous marks as well as ability test scores are included as predictors. Since 11th-grade marks were not collected, this question cannot be answered for the criterion of 12th-grade marks. The collection of 12th-grade marks, however, permitted us to deal with the question in predicting first-semester grade 13 marks from high school marks and test scores.

Prediction of Grade 13 Marks

All of the study population who attended post-secondary educational institutions were asked to report midyear marks in 12 subject areas. The subject areas were chosen to correspond to the AIM scales or to the major fields listed on the College Questionnaire and to include sizeable numbers of students. Thus, for example, the field of music, which proved highly predictable for males at grade 12, was not included in grade 13 because it seemed unlikely that sufficient numbers of students would be enrolled in music courses. Rather the composite Art/Architecture, which appeared in a list of major fields in a previous item of the questionnaire and included music, was used. Because of the small number of students from the study population in any one institution, predictions were made across all institutions pooled together. Most of these institutions were four-year or two-year colleges. However, since they also included a smattering of other kinds of schools (e.g., "vocational"), the comprehensive designation "grade 13" will be used. No attempt was made to equate marks in the various courses or institutions, although students were asked to use a common five-point scale running from fail to excellent. Intercorrelations, means, and standard deviations of grade 13 marks appear in Table I-4.

Insert Table I-4 about here

Predictors included 11th-grade PSAT-V, PSAT-M, and AIM scores, and 12th-grade marks and students' ratings of their own interests. Correlations between grade 13 marks and each of the predictors used in the regression analysis are presented in Table I-5. As expected, the 11th-grade predictors show lower relationships to grade 13 marks than they did to grade 12 marks. The superiority of PSAT over AIM in predicting marks is generally maintained for the grade 13 criteria, although the difference between the sexes in predictability is not so marked as it was at the grade 12 level. Again, the highest correlation between an AIM scale and corresponding subject is mathematics for the females, and--of the subjects appearing on both lists--social sciences for the males. These are also the subjects in which grade 12 marks are the best predictors.

Insert Table I-5 about here

Multiple correlations using an increasing number of predictors are presented in columns 1 through 5 in Table I-6. The correlations in column 1 use PSAT-V and PSAT-M as the sole predictors while those in column 5 include

Table I-4

Intercorrelations, Means and Standard Deviations for Grade 13 Marks[a]

	Biological Science	Physical Science	Mathematics	Social Science	Humanities	Art/Architecture	Education	Business	Engineering	Home Economics/ Health/Physical Education	Applied Science	Mean	S.D.	(N)
Biological Science		.51	.41	.42	.37	.33	.31	.27	*	.20	.64	3.4	.98	(844)
Physical Science	.46		.37	.32	.27	.23	.30	.22	*	.17	*	3.4	.95	(603)
Mathematics	.37	.49		.28	.27	.32	.26	.21	*	.18	.36	3.6	1.02	(1050)
Social Science	.30	.46	.33		.39	.31	.26	.36	*	.23	.44	3.7	.88	(1494)
Humanities	.31	.38	.32	.47		.36	.45	.32	*	.16	.42	3.9	.79	(1573)
Art/Architecture	.24	.22	.18	.13	.18		.54	.33	*	.21	*	4.0	.84	(560)
Education	.00	.23	.12	.32	.49	*		*	*	.09	*	4.0	.79	(227)
Business	.25	.45	.39	.39	.39	*	*		*	.31	*	4.1	.84	(306)
Engineering	*	.43	.36	.39	.30	.51	*	*		*	*	*	*	*
Home Economics/Health/ Physical Education	.23	.30	.21	.28	.25	.10	.29	.18	*		.38	4.0	.79	(1350)
Applied Science	.40	.39	.36	.20	.23	.25	*	.23	*	.17		3.7	.86	(104)
Mean	3.3	3.4	3.4	3.5	3.6	3.9	3.6	3.6	3.9	4.1	3.7			
S.D.	.97	1.02	1.12	.93	.90	.93	.94	.93	.90	.81	.93			
(N)	(492)	(755)	(1209)	(1035)	(1193)	(272)	(123)	(303)	(260)	(935)	(280)			

---

*N < 50

[a] Males below the diagonal; females above.

Table I-5

Correlations between Grade 13 Course Marks and Grades 11 and 12 Predictors

Grade 13 Interests	PSAT-V		PSAT-M		AIM		SI-1		Grade 12 Mark	
	M	F	M	F	M	F	M	F	M	F
Biological Science	.32	.27	.29	.28	.14	.14	.15	.12	--	--
Physical Science	.18	.19	.21	.27	.09	.12	.09	.09	--	--
Mathematics	.09	.23	.23	.33	.13	.22	.11	.27	.27	.37
Social Science	.30	.30	.26	.22	.24	.14	.16	.11	.35	.26
Humanities	.33	.27	.22	.19	.20(Eng) .13(F Lang)	.14(Eng) .13(F Lang)	.21(Eng) .18(F Lang)	.17(Eng) .19(F Lang)	.32(Eng)	.24(Eng)
Art/Architecture	.14	.18	.11	.16	.15	.06	.27	.12	--	--
Education	.12	.16	.01	.18	.13(Eng)	.08(Eng)	-.09(Eng)	.09(Eng)	.13(Eng)	.21(Eng)
Business	.31	.14	.34	.19	-.06(Sec) -.05(Bus)	.06(Sec) -.02(Bus)	.00(Sec) .03(Bus)	.19(Sec) .18(Bus)	--	--
Engineering	.17	--	.34	--	.09(Ind Art) .13(P Sci)	--	-.01(Ind Art) .18(P Sci)	--	--	--
Home Economics/Health/ Physical Education	.12	.03	.10	.08	.01	.02	.03	.05	--	--
Applied Science	.24	-.04	.20	.05	.06(Ind Art)	.09(Ind Art)	.01(Ind Art)	.06(Ind Art)	--	--

all available predictors. As this table indicates, the validities of these optimally weighted predictors of grade 13 marks are quite modest: the multiple correlations typically fall in the range from about .3 to .4, thus running about .10 to .15 lower for the males and about .20 lower for the females than the validities of the predicted grade 12 course marks. It should be noted that this reduction is not a function of restriction in range on PSAT. For example, PSAT-V and PSAT-M variances remained about the same for enrollees in such electives as Art at grade 12 and Art/Architecture at college. Nor do we generally find smaller variances among college marks than among high school marks.

Looking across columns for each of the subject fields gives an indication of the contribution of marks and interests over PSAT in predicting grade 13 marks. For males, we find that there are only three fields (social science, art/architecture, and education) for which the inclusion of interests and marks (when available) increases the multiple correlation by .10 or more; for females, this great an increment is found only in the field of business. Comparing columns 4 and 5, we find only one instance, education for males, in which interests add appreciably to the prediction over PSAT and previous marks. In predicting grade 13 marks in the fields of mathematics, social sciences, and humanities, interests appear to provide virtually no incremental validity if information about abilities and 12th-grade marks is available.

Again, as for grade 12 marks, student-rated interests are just about as valid as AIM for predicting 13th-grade marks (Tables I-5, I-6). Indeed, the only substantial differences between columns 2 and 3 in Table I-6 favor SI-1 over AIM (Art for males, Business for females). It should be noted, of course, that in this case the ratings (SI-1) were obtained in grade 12, whereas AIM scores were obtained in grade 11.

Insert Table I-6 about here

Differential Prediction of Marks

In a situation that permits a student to choose a course from two or more options, he may want to know whether he can expect greater success (in some sense) in one course than in another. In school settings, this question is often posed in terms of differential prediction of marks. In general, tests have tended to predict grade point average or marks in most subjects moderately well. The intercorrelations between marks in various subjects tend to be quite high, however, in relation to their reliability, and differential prediction based on aptitude tests has generally proven a will-o'-the-wisp.

French (1954) used a battery of "pure-factor" aptitude tests in an attempt to enhance differential prediction. He also included in his battery half-length scales of the Cooperative Interest Inventory (precursor to AIM) The aptitude tests proved to have moderate validity for absolute prediction, but virtually no differential validity. What differential validity he did find (in predicting marks in college subjects) was attributable primarily to the interest scales. Since he used the CII scales only in his study of the college students, and not in his high school study, there has been some interest in ascertaining the validity of AIM for differential prediction of high school marks, as well as taking another look at its differential validity for college marks.

Table I-6

Multiple Correlations for Predicting Grade 13 Marks (1), from 11th-Grade PSAT-V (2), PSAT-M (3), and AIM (4), and 12th-Grade Interests (5), and Marks for Selected Fields* (6)

Subject Field	MALES Col 1 R1.23	Col 2 R1.234	Col 3 R1.235	Col 4 R1.236	Col 5 R1.23456	FEMALES Col 1 R1.23	Col 2 R1.234	Col 3 R1.235	Col 4 R1.236	Col 5 R1.23456
Biological Science	.34	.35	.35		.36	.31	.33	.33		.34
Physical Science	.22	.23	.22		.23	.27	.28	.28		.28
Mathematics*	.24	.25	.25	.31	.31	.33	.34	.37	.42	.42
Social Science*	.31	.36	.34	.40	.42	.30	.31	.31	.36	.36
Humanities*	.33	.34	.35	.39	.41	.27	.28	.29	.31	.34
Art/Architecture	.14	.20	.29		.30	.19	.19	.22		.22
Education*[a]	.14	.17	.19	.18	.32	.19	.20	.21	.24	.26
Business	.35	.37	.37		.37	.19	.20	.28		.32
Engineering	.35	.35	.35		.38	---	---	---		---
Home Economics/Health/ Physical Education	.12	.13	.13		.13	.09	.09	.10		.10
Applied Science	.25	.26	.25		.26	.11	.12	.11		.12

[a] Using AIM English, SI-1 English, 12th Grade English Marks.

Differential validity is generally expressed as the correlation between predicted and observed differences (R_{d*d}), as computed from the following formula (Mollenkopf, 1950):

$$R_{d*d} = \sqrt{\frac{R^2_{a*a} + R^2_{b*b} - 2R_{a*a}R_{b*b}r_{a*b*}}{2(1 - r_{ab})}}$$

where R_{a*a} or R_{b*b} is the multiple R for predicting criterion a or b

r_{a*b*} is the correlation between predicted criteria

r_{ab} is the correlation between actual criteria.

This formula is based on the assumption that the criterion measures have equal variances. In practice, they would ordinarily be rescaled to achieve equal variances by converting the criterion measures to standard scores.

In effect, the size of this R_{d*d} determines whether comparative predictions (i.e., predictions comparing most likely marks in two subjects or chances of obtaining a given mark in two subjects) are justified. As is apparent from the equation, in order to get a high differential validity (R_{d*d}) for two courses with a given r_{ab}, R_{a*a} and R_{b*b}, a test battery must be designed that, in effect, minimizes r_{a*b*} (that is, takes minimum advantage of that which is common to both criteria and makes maximum use of that which is unique to each of the criteria).

Ordinarily, however, in constructing or selecting predictors, one is not concerned solely with differential prediction; it is also important to make the most accurate prediction possible of marks in each subject. For predicting marks in most high school subjects, the regression equations are likely to include a set of variables that have similar regression weights for each of the criteria. To the extent that the regression weights are similar for any pair of criteria, differential prediction is diminished. It was to avoid predictors with high intercorrelations that French put his trust in pure-factor aptitude tests. Since AIM scales tend to have generally low intercorrelations and low correlations with PSAT, they have been regarded as promising for differential prediction. It is now possible to examine the extent to which they fulfill that promise for differential prediction of marks in grades 12 and 13.

Differential prediction of grade 12 marks. Differential prediction of grade 12 marks from grade 11 measures were computed for the same five per cent random sample used earlier in prediction of grade 12 marks. To make the data comparable from one pair of courses to another, it was necessary to confine analyses to a group of courses all taken by the same students. Since all students do not take all courses, the number of criterion pairs was very small. A further restriction was that differential validities were computed only for those pairs of courses in which at least 50 students of each sex with complete data were enrolled.

Tables I-7, I-8, and I-9, displayed together, show the magnitude of the differential correlations and help "explain" them. Table I-7 presents the differential correlations (R_{d*d} , correlations between predicted and observed differences) for 12th-grade marks, using 11th-grade PSAT-V, PSAT-M, and AIM as predictors. In each case, only the AIM scale that corresponded to the predicted subject field was used. The intercorrelations of obtained 12th-grade marks (r_{ab}) appear in Table I-8, and the intercorrelations of predicted marks (r_{a*b*}) in Table I-9.

The following generalizations on differential prediction of 12th-grade marks can be made from these tables:

1. Except for predicting differences between English and mathematics marks for the males ($R_{d*d} = .45$), the differential correlations are in the .20's and .30's (Table I-7).
2. The differential correlations are invariably higher for males than for females (Table I-7). This is attributable, at least in part, to the fact that intercorrelations both of obtained marks (Table I-8) and of predicted marks (Table I-9) are almost invariably higher for females than for males. (The sole exception is between physics and social studies in Table I-8.)
3. The data in the tables tend to bear out the common-sense proposition that high intercorrelations between obtained marks for a pair of subjects (Table I-8) make differential prediction quite difficult. Further, a combination of predictors and criteria that results in high intercorrelations of predicted marks (Table I-9) also tends to prevent highly valid differential prediction.

To illustrate this third observation, note that the pair of subjects with the highest intercorrelations in Tables I-8 and I-9 are English and social studies for the females (.57 and .96, respectively). The corresponding differential correlation in Table I-7 is .21. One other differential correlation in Table I-7 is equally low (physics and mathematics for females). For this pairing also the values in Tables I-8 and I-9 are relatively high (.51 and .94, respectively).

Insert Tables I-7, I-8, and I-9 about here

Table I-7

Differential Correlations (R_{d*d}) for Grade 12 Course Marks, Using 11th-Grade PSAT-V, PSAT-M, and AIM[a]

	English	Mathematics	Physics/Chemistry	Social Studies/ History/Geography
English	---	.39	.27	.21
Mathematics	.45	---	.21	.33
Physics/Chemistry	.36	.29	---	.31
Social Studies/ History/Geography	.27	.39	.38	---

Table I-8

Intercorrelations of Obtained Grade 12 Marks (r_{ab})[a]

	English	Mathematics	Physics/Chemistry	Social Studies/ History/Geography
English	---	.42	.35	.57
Mathematics	.23	---	.51	.54
Physics/Chemistry	.34	.41	---	.46
Social Studies/ History/Geography	.56	.39	.49	---

Table I-9

Intercorrelations of Predicted Grade 12 Marks (r_{a*b*})[a]

	English	Mathematics	Physics/Chemistry	Social Studies/ History/Geography
English	---	.71	.83	.96
Mathematics	.07	---	.94	.86
Physics/Chemistry	.54	.73	---	.86
Social Studies/ History/Geography	.79	.49	.65	---

---

[a] Males below the diagonal; females above.

The data in these tables may seem to support the converse proposition, that low correlations between obtained marks for a pair of subjects and/or between predicted marks for that pair tend to be associated with high differential correlations. Thus, the highest differential correlation in Table I-7 is found in the pairing of English and mathematics for males (.45). This pairing has the lowest correlations in Tables I-8 and I-9 (.23 and .07, respectively). We would not press this converse, however, beyond suggesting that low correlations between obtained and/or between predicted marks for a pair of subjects enhance the possibilities for valid differential prediction but do not guarantee it.

A final consideration is the incremental contribution of AIM to differential prediction of 12th-grade marks. Table I-10, showing the differential correlations for 12th-grade course marks using only 11th-grade PSAT-V and PSAT-M as predictors, may be compared directly with Table I-7, in which AIM scales were included among the predictors. In general, there is an appreciable increase in the differential correlations when AIM is included among the predictors. The most dramatic increment is noted for males, for the criterion pair Social Studies-Physics (an increase of .30).

Insert Table I-10 about here

Differential prediction of grade 13 marks. The analysis of the grade 13 level, like that at the grade 12 level, was based on complete-data cases only--i.e., students having course marks in all of the following four subject areas: Physical Science, Mathematics, Social Science, and Humanities. This restriction to cases with complete data brought the sample size down to 150 males and 104 females.

Table I-10

Differential Correlations (R_{d*d}) for Grade 12 Marks

Predicted from PSAT-V and PSAT-M[a]

	English	Mathematics	Physics/ Chemistry	Social Studies/ History/Geography
English	---	.19	.24	.11
Mathematics	.38	---	.09	.20
Physics/Chemistry	.23	.24	---	.27
Social Studies/ History/Geography	.21	.27	.08	---

[a] Males below the diagonal; females above.

Table I-11

Selected Means for Complete-Data Sample and Total Grade 13 Sample

	Complete-Data Sample		Total Grade 13 Sample	
	Males	Females	Males	Females
PSAT-V	46.8	46.9	43.0	43.1
PSAT-M	53.4	48.1	48.0	43.4
AIM - P Sci	24.2	16.3	21.7	13.7
Math	24.4	20.0	20.3	15.2
Soc Sci	20.1	21.4	19.2	18.8
Eng	15.9	20.2	15.0	20.7
F Lang	17.7	22.9	16.2	23.1
SES	3.6	3.8	3.4	3.5

The complete-data sample generally had higher ability and interest scores and higher SES level than the total grade 13 group. Comparisons of group means for several variables are presented in Table I-11.

Insert Table I-11 about here

At the high school level, as was indicated in Table I-7, course mark differences could be predicted better for males than for females. Differential correlations for grade 13 marks (Table I-12) reverse this pattern: the grade 13 coefficients are invariably higher for the females than for the males. This reversal is marked by an increase from grade 12 to 13 in every differential correlation for females and a decrease in every differential correlation for males. Yet the multiple correlation between each subject field and its set of predictors (R_{a*a} or R_{b*b}) has, again without exception, decreased from grade 12 to grade 13 for females as well as for males. Perhaps we may help to account for the reversal by comparing Table I-13 with Table 1-8, and Table I-14 with Table I-9. In grade 12 (Table I-8), the intercorrelations of obtained marks tended to be higher for females than for males; in grade 13, however (Table I-13), these intercorrelations are more frequently higher for males. This shift is not attributable to restriction in range: for example, the standard deviation for mathematics marks is 1.06 for males and 1.00 for females. Rather, it appears to be associated primarily with consistently lower course mark intercorrelations (r_{ab}) for the females in grade 13 than in grade 12. No comparable consistency appears

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Insert Tables I-12, I-13, and I-14 about here

Table I-12

Differential Correlations (R_{d*d}) for Grade 13 Marks Using PSAT-V, PSAT-M, SI-1, AIM and Grade 12 Marks as Predictors[a]

	Humanities	Mathematics	Physical Science	Social Science
Humanities	---	.49	.40	.32
Mathematics	.33	---	.31	.55
Physical Science	.33	.21	---	.54
Social Science	.22	.30	.35	---

Table I-13

Intercorrelations of Obtained Grade 13 Marks (r_{ab})[a]

	Humanities	Mathematics	Physical Science	Social Science
Humanities	---	.14	.23	.54
Mathematics	.27	---	.46	.12
Physical Science	.29	.50	---	.23
Social Science	.47	.26	.35	---

Table I-14

Intercorrelations of Predicted Grade 13 Marks Using PSAT-V, PSAT-M, SI-1, AIM and Grade 12 Marks as Predictors (r_{a*b*})[a]

	Humanities	Mathematics	Physical Science	Social Science
Humanities	---	.08	.26	.84
Mathematics	.62	---	.78	.02
Physical Science	.58	.82	---	.00
Social Science	.89	.57	.43	---

---

[a] Males below the diagonal; females above.

in the differences between grade 12 and grade 13 course mark intercorrelations for the males. Just why this asymmetry occurs is not clear, for no range restrictions are noted among the criteria, and the changes in PSAT variances from the grade 12 sample to the grade 13 sample are about the same for males and females.

These decreased intercorrelations between obtained marks for females are accompanied by decreases in intercorrelations between predicted marks (r_{a*b*}). The above-diagonal correlations in Table I-7 invariably exceed the corresponding correlations in Table I-14. A similarly consistent shift does not hold true for the males.

In short, then, the sharp decreases from grade 12 to grade 13 in r_{ab} _and_ r_{a*b*} for the females are accompanied by a marked increase in R_{d*d}. For the males, with the exception of the social science-physical science pair, whatever decreases occur in r_{ab} seem to be counteracted by increases in r_{a*b*}, and R_{d*d} is diminished.

Differential correlations for grade 13 marks using only PSAT-V, PSAT-M, and grade 12 marks as predictors appear in Table I-15. A comparison of Table I-15 with Table I-12 indicates the incremental contribution of the interest measures to differential validities in predicting grade 13 marks. In general, it is clear that interests (including both AIM and SI-1) add substantially to the differential prediction of grade 13 marks, even when grade 12 marks are included with PSAT scores as predictors. PSAT-V, PSAT-M, and grade 12 marks, however, typically account for the major proportion of the total predicted variance.

Insert Table I-15 about here

Table I-15

Differential Correlations (R_{d*d}) for Grade 13 Marks Using PSAT-V, PSAT-M and 12th-Grade Marks as Predictors[a]

	Humanities	Mathematics	Physical Science	Social Science
Humanities	---	.42	.37	.17
Mathematics	.23	---	.22	.43
Physical Science	.25	.09	---	.43
Social Science	.19	.29	.28	---

[a] Males below the diagonal; females above.

Table I-16

French's Estimates of Validities of Predicted Differences (Assuming $r_{ab} = .42$)

	Biology	History	English	Mathematics
Biology	---			
History	.35	---		
English	.28	.24	---	
Mathematics	.37	.30	.32	---

Differential correlations (or differential validities as they are frequently called) for college freshman grades were reported in the Comparative Prediction Study and are reproduced below (French, 1961):

Insert Table I-16 about here

While the magnitude of these validities closely resembles those obtained in the present study, direct comparisons are inappropriate for several reasons. Notable differences are apparent in the populations of the two studies and in the schedules of data collection. The Comparative Prediction Study used as criteria marks obtained at the end of the freshman year by students in three colleges who had taken the test battery early in the freshman year. One of these colleges was for women and two were coeducational. The validity estimates reproduced in Table I-16 are averages of differential validities for various groups of students in the three colleges taking a given pair of subjects in the four fields named. This means that the differential correlation for each pair of subjects is based on a different combination of subgroups. Some of these subgroups consist of males only, some of females only, and some of males and females. For example, the students taking Mathematics are comprised of 458 males in four groups, 87 females in two groups, and 545 males and females in six groups; taking English are 820 males in four groups, 1315 females in five groups, and 2134 males and females in nine groups. We have previously noted the interaction among interests, sex, and courses taken. Thus, some of the variation in differential correlations appearing in Table I-16 may be a function of the distinctive groups in each pair of fields. For instance, the ratio of males to females in any pairing of subjects seems likely in itself to exercise a considerable effect on the averaged differential correlation.

The present study, it will be recalled, started with a national sample of high school juniors, collected predictor variables in grades 11 and 12, and used marks obtained at the end of the first semester of grade 13 as criteria. It consistently treats data for males and for females separately. The differential correlations are based on a single population that took courses in all of the fields from which pairs were drawn. This restriction makes comparisons across pairings possible, since all of the differential correlations are based on the same group of students of each sex. It also permits computations of intercorrelations between obtained marks in different fields (r_{ab}), a point which warrants some emphasis.

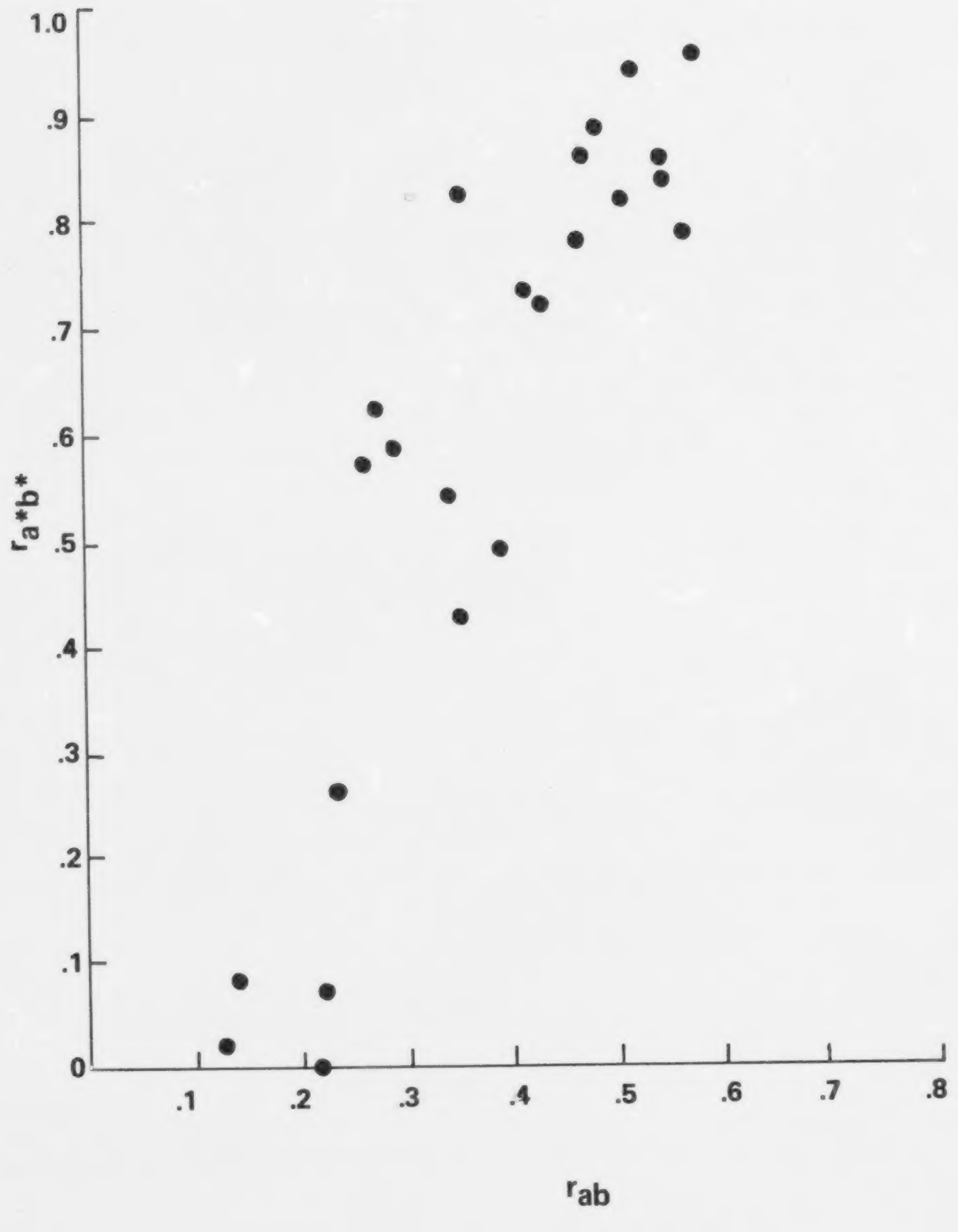
Since the students in French's sample had not taken all the pairs of courses, intercorrelations between obtained marks in different fields could not be computed. Instead, two assumptions were used in computing differential validities: one was $r_{ab} = 0$, and the other was $r_{ab} = .42$ (an estimate of the average correlation between course marks). This use of a fixed value of r_{ab} across subject fields without proper regard to the relationships between r_{a*b*} and r_{ab} implies an independence between the two that is mathematically possible but does not in practice exist. Empirically, it is found (as illustrated in Tables I-8 and I-9, I-13 and I-14) that small values of r_{ab} are associated with small values of r_{a*b*} while large values of r_{ab} are associated with even larger values of r_{a*b*}. This relationship between the magnitude of r_{ab} and r_{a*b*} is clearly seen in plotting the 24 pairs of correlations from these four tables (Figure I-1). (For an additional empirical observation of the relationship between r_{ab} and r_{a*b*} see Figure II-1 in the next chapter.)

Insert Figure I-1 about here

Figure I-1

Relationship between r_{ab} and r_{a*b*}

(From Tables I-8, I-9, I-13, & I-14)



This situation holds particularly when, as indicated previously, test batteries are developed to provide good absolute as well as differential prediction.

To clarify this point, consider the following sketch (Figure I-2), which represents all the elements, common and unique, to a test battery and two criteria:

Insert Figure I-2 about here

The multiple correlations for criterion 1 can be represented as

$$\frac{A + B}{A + B + C + D + U_1 + U_x}$$

and for criterion 2 as

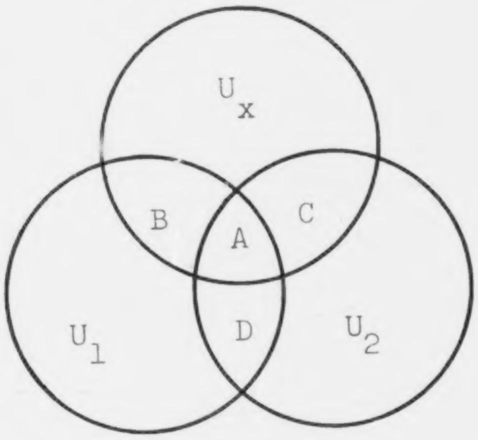
$$\frac{A + C}{A + B + C + D + U_2 + U_x} .$$

Under the assumption that r_{ab} is a constant for a given pair of courses, we see that any variation in r_{a*b*} across subject fields must be offset by a function of D, U_1, and U_2--a set of circumstances that is highly improbable. In other words, with r_{ab} held constant, the trick in enhancing differential validity is to increase B and C "at the expense of" U_1 and U_2, while minimizing A.

In fact, however, what is most predictable in school marks seems to be mainly what they have in common. Thus, since test batteries are usually designed to maximize the multiple R for each criterion, it is almost impossible to construct them in such a way as to increase B and C without also increasing A. This was the reasoning that led French to use pure-factor aptitude tests--to try to cut into uncorrelated error rather

Figure I-2

Common and Unique Elements in a Test Battery and Two Criteria



In this sketch,

U_x stands for what is unique to the test battery x;

U_1 for what is unique to criterion 1;

U_2 for what is unique to criterion 2;

B for what is common to criterion 1 and to the test battery;

C for what is common to criterion 2 and to the test battery;

A for what is common to both criteria and to the test battery;

D for what is common only to both criteria.

The correlation between predicted criteria, r_{a*b*}, can be represented as

$$\frac{A}{A + B + C} .$$

The correlation between the observed criteria, r_{ab}, can be represented as

$$\frac{A + D}{A + B + C + D + U_1 + U_2} .$$

than correlated error. Clearly, the larger the actual correlation between criteria, the more likely will be a large value of A (the area common to the test battery and both criteria). A large value of A in turn precludes a small value of r_{a*b*}. As indicated by the steep slope in Figure I-1, r_{ab} and r_{a*b*} tend to vary together--a situation that limits attempts to develop batteries that will be useful simultaneously for both differential and absolute prediction.

The most fertile opportunities for differential prediction would clearly be offered by pairs of courses with low r_{ab}. These pairings are perhaps most likely to be found in two-year comprehensive community colleges, characterized by a wide variety of academic, business, technological, and vocational programs. Differences in programs will not suffice, of course, unless accompanied by differences in criteria. As long as marks in various subjects are determined largely by examinations that tap verbal ability, pairings with low r_{ab} (and low r_{a*b*}) will continue to be rare, and differential prediction will continue to be a will-o'-the wisp.

Meanwhile, until differentiated criteria are developed, marks in courses will probably still tend to vary along a single dimension representing level of difficulty, and counselors and students will find that a generalized scholastic aptitude test plus previous course marks offer the most efficient predictions for guidance.

II: THE PREDICTION OF INTERESTS

We have found that interest measures generally make a modest contribution to the prediction of course marks when ability measures are available, and add virtually nothing when previous marks are available. While interest measures do tend to contribute somewhat to differential prediction of marks, the utility of that contribution is not clear.

That the connection between AIM and later marks is tenuous seems entirely logical if one accepts the conceptualization of interests as only one component of a motivational complex. Interests may sometimes, for some individuals in some settings, be in alignment with other components of these individuals' motivational systems--such as ambition, unwillingness to delay gratification, and whatever other needs and values are most relevant to the criterion. At other times, interests may run counter to the rest of the array of relevant components. To trace the workings of interests through a complex system in order to isolate their effects on marks would require an analysis of many variables not available in this study.

Perhaps a similar argument holds for interests as predictors of the criterion called "satisfaction." French (1959, 1961) found very low correlations between the interest scores of freshmen and their expressed satisfaction with major field as seniors. But again--like marks--satisfaction in a course may be too inclusive a criterion. It may incorporate the student's perceptions of the instrumentality of a course in respect to all the values and goals he deems important. These may include, for example, the usefulness of the course for his vocational plans, the marks he gets, his liking for the instructor and fellow-students--a host of variables. A standardized measure of interests that emphasizes activities cannot be expected to predict all these components of satisfaction. Each of these other components may represent a specific form of reward. Satisfying an intrinsic interest in the activities associated with a course may represent another specific form of reward, which may be of greater or lesser importance to different individuals. Certainly for many of the current college generation, "doing one's own thing"--the activities one enjoys--has become a frequently powerful motive. This observation suggests that prediction of interests qua interests is of use in a guidance program. Such use does not require that we ignore the criterion of marks--which often serve as external reality factors in influencing career decisions. Nor does it require abandoning the other "internal reality" factors involved in satisfaction. Instead, it recognizes the value of predicting intrinsic activity interest as one of a number of components of satisfaction, important in its own right, and probably the most appropriate criterion by which to evaluate the capabilities of AIM.

The Criterion Measures

A student questionnaire administered at the end of grade 12 included an item asking students to rate their interest in each of the 12 subject fields represented by the names of the AIM scales. These self-rated interests (SI-1) were used as the grade 12 interest criteria for the five per cent random sample of students who had made interest ratings (SI) while in 11th grade. They also served as predictors for the criterion data obtained in grade 13.

Among the grade 13 criteria were similar ratings (SI-2). Three additional items in the College Questionnaire in Appendix A asked about interest in attending classes (SI-2A), in doing required readings (SI-2B), and in doing required assignments other than readings (SI-2C) for each of the 12 subject fields. Two other items asked about satisfaction in amount learned (SE-2D) and in grades received (SI-2E). In general, intercorrelations among SI-2, SI-2A, SI-2B, and SI-2C tend to be quite high. The last item, SI-2E, satisfaction in the grades received in each field, has consistently lower correlations with the other items. It is therefore regarded as an inappropriate measure of interests. Intercorrelations among the six items for the field of humanities (Table II-1) illustrates the typical pattern.

Insert Table II-1 about here

In every case, the lowest correlations appear in the row and column for 2E. Entries for 2D, while higher than those for 2E, tend to be lower than the others. The magnitudes of the correlations vary in other fields, but this pattern of relationships is the same in every subject field. It suggests that interest in the aspects of each subject field represented by SI-2, SI-2A, SI-2B, and SI-2C is unidimensional.

In view of the high intercorrelations, ratings on only one of the four interest items--SI-2--served as grade 13 interest criteria. This item was chosen for two reasons: (1) it best represents the set of items across the 12 subject fields and across both sexes, and (2) it corresponds with measures used in other studies.

The use of students' ratings of interest both as predictors (SI at grade 11 and SI-1 at grade 12) and criteria (SI-1 at grade 12 and SI-2 at grade 13) requires some explanation to offset the notion that correlations between SI and SI-1 and SI-1 and SI-2 are merely indices of reliability (stability) rather than of validity.

Table II-1

Intercorrelations among Six Grade 13 Interest and Satisfaction Items for the Subject Field, Humanities[a]

	SI-2	SI-2A	SI-2B	SI-2C	SI-2D	SI-2E
SI-2	---	.68	.57	.53	.41	.30
SI-2A	.74	---	.60	.58	.51	.32
SI-2B	.66	.69	---	.64	.46	.26
SI-2C	.64	.69	.66	---	.44	.29
SI-2D	.51	.58	.53	.57	---	.37
SI-2E	.23	.27	.24	.27	.36	---

[a] Males below the diagonal; females above.

First, it should be noted that high school subject fields are being rated in SI-1, while college subject fields are being rated in SI-2. Indeed, some of the grade 13 designations pool several grade 12 subject titles along with additional subject titles. For example, "Humanities" is defined to include "English, journalism, philosophy, foreign languages, etc."

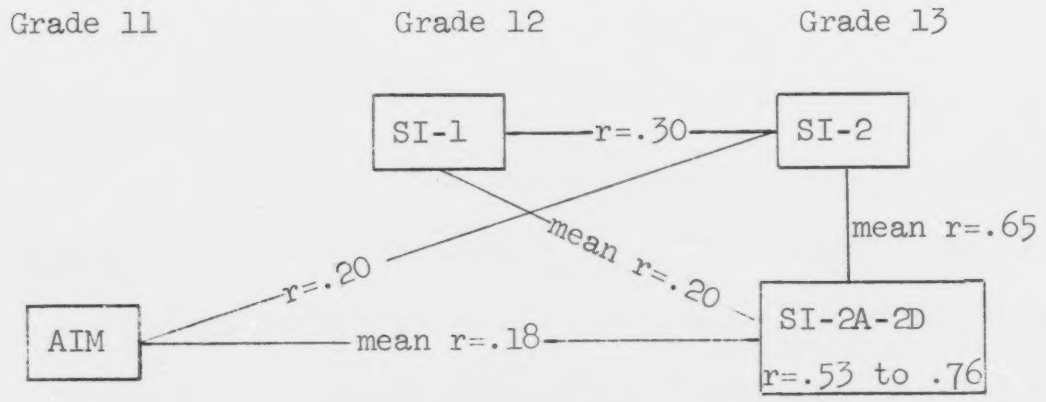
Second, SI-2 does not represent merely students' global ratings of interest in subject fields. It also "stands for" expressions of interest in several aspects of activity in each subject--i.e., attending classes, doing required reading, doing other required assignments such as term papers and laboratory reports--and (to a lesser extent) satisfaction with the amount learned in each field. For every field, the correlations between SI-2 and these four other items in grade 13 are much larger than the correlations between SI-1 and SI-2. Furthermore, the correlations between SI-2 and the four other grade 13 items are of the same order of magnitude as the intercorrelations among the four other items.

Incidentally, it is interesting to note that SI-1 "behaves" as a predictor very much like AIM. The correlations between AIM and SI-2 are generally less than but of approximately the same order as the correlations between SI-1 and SI-2. The difference between the two sets of correlations can be attributed, at least in part, to the fact that the AIM measures were obtained one year earlier (in grade 11) than SI-1 (in grade 12). The correlations between AIM and the four other interest items are also generally of the same order as the correlations between SI-1 and these same four items. A typical example of these relationships is sketched out in Figure II-1.

Insert Figure II-1 about here

Figure II-1

Pattern of Relationships among Interest Variables


Grade 11
Grade 12
Grade 13
SI-1
r=.30
SI-2
mean r=.65
mean r=.20
r=.20
AIM
mean r=.18
SI-2A-2D
r=.53 to .76

Prediction of Grade 12 Interests

Intercorrelations, means and standard deviations for grade 12 interests (SI-1) are given in Table II-2.

In rating these interests, students used a five-point scale from 1 (Very uninteresting) to 5 (Very interesting) with the score 3 (Neither interesting nor uninteresting) representing an indifference level.

Insert Table II-2 about here

The means and standard deviations of these 12th-grade ratings (SI-1) are highly consistent with those of the 11th-grade ratings (SI), as reported in Tables 12a and 12b in Part I of this report (Katz, Norris, and Halpern, 1970). In both SI and SI-1, three of the 12 fields for males have mean scores below the indifference level (secretarial, foreign languages, and home economics); for females, the mean for only one field (industrial arts) falls below the indifference level. For both sexes, the field of biology has the highest mean score. Table 1 in the Introduction shows AIM Biology to be the fourth highest ranking scale for the males and the ninth highest scale for the females. Thus, the tendency for students to rate biology as "interesting" in grade 11 (noted in Part 1, op. cit.) is reiterated in grade 12. As indicated in Table II-3, the correlations between AIM and SI-1 in biology remain moderate (.33 for males and .36 for females), representing a loss of 10 points for males and five points for females from the correlations between AIM and SI.

Zero-order correlations between 12th-grade interests (SI-1) and each of three 11th-grade predictors are presented in Table II-3. As would be expected, abilities are relatively poor indicators of interests, particularly

Table II-2

Intercorrelations, Means and Standard Deviations for Grade 12 Interests (SI-1)[a]

	Biology	English	Art	Mathematics	Social Studies	Secretarial	Physical Sciences	Foreign Languages	Music	Industrial Arts	Home Economics	Business	Mean	S.D.	(N)
Biology	---	.10	.13	.14	.17	-.11	.39	.15	.06	.13	-.02	-.15	4.1	.96	(322)
English	.29	---	.20	.13	.33	.01	.13	.30	.24	.10	.04	.02	4.0	.87	(323)
Art	.18	.15	---	.05	.05	-.12	.09	.23	.26	.17	.05	-.16	3.8	1.22	(320)
Mathematics	.21	.13	.04	---	.13	.13	.34	.11	.16	.19	.12	.12	3.4	1.40	(322)
Social Studies	.28	.32	.14	.16	---	.05	.28	.22	.20	.10	.05	.00	3.6	1.14	(322)
Secretarial	.12	.14	.16	.18	.19	---	.03	.05	.09	.12	.26	.71	3.7	1.24	(322)
Physical Sciences	.45	.27	.15	.24	.27	.11	---	.23	.17	.29	.12	.02	3.1	1.29	(323)
Foreign Languages	.25	.38	.22	.22	.33	.16	.39	---	.28	.16	-.04	.00	3.5	1.22	(322)
Music	.22	.36	.42	.09	.20	.23	.20	.31	---	.25	.22	.14	3.7	1.20	(322)
Industrial Arts	.04	-.04	.27	.07	-.02	.13	.01	-.12	.11	---	.23	.17	2.6	1.26	(320)
Home Economics	.12	.10	.14	.11	.15	.39	.13	.10	.22	.25	---	.36	3.9	1.15	(323)
Business	.16	.05	.03	.20	.21	.30	.10	.04	.05	.17	.29	---	3.7	1.24	(322)
Mean	3.9	3.4	3.5	3.5	3.8	2.1	3.4	2.8	3.1	3.5	2.1	3.4			
S.D.	.99	1.18	1.24	1.20	1.12	1.09	1.23	1.29	1.39	1.21	1.14	1.24			
(N)	(347)	(347)	(345)	(346)	(347)	(342)	(345)	(343)	(343)	(344)	(343)	(342)			

---

[a] Males below the diagonal; females above.

for males. Appropriate AIM scores, however, are quite substantially related to these criteria.

Insert Table II-3 about here

Multiple correlations for 12th-grade interests predicted from 11th-grade abilities and interests are presented in Table II-4. Using PSAT-V, PSAT-M, and AIM as predictors (column 2), the multiple correlations typically fall in the range from .4 to .5. A comparison of the last two columns of Table II-3 with columns 2 of Table II-4 shows that the multiple correlations, with the exception of physical science for the males and home economics for the females, fall within .05 of these zero-order correlations between grade 12 interests and AIM.

If AIM is replaced by 11th-grade interest ratings, SI (column 3), the multiple correlation is increased by 10 points or more in biology, English, and physical science interests for females and in biology interest for males. This replacement decreases the multiple correlation by 10 or more points, however, in business interest for females and art and industrial arts for males. One important qualification should be noted here, namely that several of the subject field titles were changed from the 11th-grade to 12th-grade questionnaires, as follows:

11th Grade	12th Grade
Social Sciences	Social Studies
Fine Arts	Art
Engineering	Industrial Arts
Executive	Business

Table II-3

Correlations between Grade 12 Interests (SI-1) and

Grade 11 PSAT-V, PSAT-M and AIM

Grade 12 Interest	PSAT-V		PSAT-M		AIM	
	M	F	M	F	M	F
Biology	.15	.19	.09	.18	.33	.36
English	.20	.24	.09	.22	.48	.39
Art	-.04	.21	-.06	.15	.52	.52
Mathematics	.05	.06	.23	.28	.56	.61
Social Studies	.13	.31	.08	.21	.44	.44
Secretarial	-.04	-.27	-.05	-.14	.26	.56
Physical Science	.24	.16	.30	.20	.35	.41
Foreign Language	.30	.25	.21	.26	.46	.49
Music	.05	.08	.00	.02	.54	.54
Industrial Arts	-.20	.03	-.16	.05	.45	.31
Home Economics	-.12	-.23	-.09	-.10	.33	.28
Business	-.12	-.31	-.08	-.21	.35	.51

These changes in designation of subject fields may account, at least in part, for the instances in which the multiple correlation is decreased by substituting SI for AIM.

For females, mathematics is found to be the best predicted interest field regardless of whether AIM or SI is included as a predictor; for males, mathematics is the best predicted field when AIM is used as a predictor. Including both AIM and SI as predictors (column 4 of Table II-4) mathematics is found to be the best predicted interest for both males (.64) and females (.68), with music second (.63).

Insert Table II-4 about here

Prediction of Grade 13 Interests

Means and standard deviations for grade 13 interests (SI-2) are given in Table II-5. As with grade 12 interests, students used a 5-point scale to rate their interests, the score 3 representing an indifference level. The field of agriculture is not included in this table nor in the following tables, because too few cases were available on which to base the analyses.

Insert Table II-5 about here

At grade 13, social science for males and social science and humanities for females are the highest rated interest fields. Biology, which was the highest rated field for both sexes in grades 11 and 12, ranks second for the males and ties for third place with Art/Architecture for the females.

Table II-4

Multiple Correlations for Predicting 12th-Grade Interests (1)
from 11th-Grade PSAT-V (2), PSAT-M (3), AIM (4), and SI (5)

Grade 12 Interest (1)	MALES Col 1 R1.23	 Col 2 R1.234	 Col 3 R1.235	 Col 4 R1.2345	FEMALES Col 1 R1.23	 Col 2 R1.234	 Col 3 R1.235	 Col 4 R1.2345
Biology	.15	.36	.51	.52	.20	.39	.49	.50
English	.22	.48	.54	.60	.25	.42	.52	.55
Art	.06	.52	.36	.55	.21	.54	.45	.56
Mathematics	.30	.57	.57	.64	.36	.63	.65	.68
Social Studies	.14	.44	.36	.47	.31	.48	.45	.50
Secretarial	.05	.27	.29	.34	.28	.57	.60	.63
Physical Science	.30	.43	.49	.51	.20	.43	.58	.61
Foreign Languages	.31	.51	.51	.55	.27	.51	.56	.58
Music	.08	.54	.59	.63	.10	.54	.59	.63
Industrial Arts	.20	.47	.29	.47	.05	.31	.25	.37
Home Economics	.12	.34	.38	.43	.25	.41	.48	.52
Business	.12	.39	.36	.42	.31	.55	.41	.59

Table II-5

Means and Standard Deviations for Grade 13 Interests (SI-2)

	MALES		FEMALES	
	Mean	S.D.	Mean	S.D.
Biological Science	3.7	1.13	3.9	1.12
Physical Science	3.6	1.15	3.2	1.21
Mathematics	3.5	1.24	3.2	1.39
Social Science	3.8	1.09	4.2	1.01
Humanities	3.6	1.16	4.2	.94
Art/Architecture	3.4	1.21	3.9	1.13
Education	3.0	1.12	3.8	1.10
Business	3.3	1.23	3.1	1.30
Engineering	3.3	1.24	2.2	1.14
Home Economics/Health/ Physical Education	3.2	1.22	3.7	1.21
Applied Science	3.3	1.19	2.5	1.20

Correlations between grade 13 interests and each of the predictors are presented in Table II-6. Multiple correlations for predicting grade 13 interests from 11th-grade PSAT-V, PSAT-M, and AIM and 12th-grade interests (SI-1) are presented in Table II-7.

Insert Tables II-6 and II-7 about here

Summarizing these tables we find that:

1. Again, as in predicting 12th-grade interests, previous interests are much better than abilities as predictors. Either AIM or 12th-grade interests contributes much more than PSAT-V or PSAT-M to the prediction of grade 13 interests. To find an exception in Education is not surprising, since none of the predictor variables is labeled "Education" or appears to be particularly appropriate for it.
2. Grade 12 interest (SI-1) is generally the best predictor of grade 13 interest. The superiority of this variable over AIM is, however, most likely a function of testing time (grade 11 for AIM; grade 12 for SI-1).
3. For both sexes, mathematics interest is predicted best of all subject fields in grade 13, just as it had been in grade 12.
4. Multiple correlations for grade 13 interests are generally much higher than those for grade 13 marks in all fields and for both sexes, with one minor exception: for females, interests and marks in the field of social science in grade 13 are predicted about equally.
5. The level of interest prediction seems to remain remarkably stable regardless of whether we are predicting grade 12 interests for the

Table II-6

Correlations between Predictors and Grade 13 Interests

Grade 13 Interests	PSAT-V		PSAT-M		AIM		SI-1	
	M	F	M	F	M	F	M	F
Biological Science	.04	.09	-.02	.05	.37	.34	.52	.48
Physical Science	.06	-.01	.12	.07	.32	.32	.42	.34
Mathematics	-.01	-.06	.19	.25	.42	.57	.58	.64
Social Science	.15	.18	-.01	.09	.38	.22	.40	.30
Humanities	.21	.18	.05	.03	.41(Eng)	.33(Eng)	.40(Eng)	.39(Eng)
Art/Architecture	.06	.11	.00	.07	.46	.43	.49	.47
Education	-.06	-.16	-.12	-.11	.17(Eng)	.02(Eng)	.14(Eng)	.10(Eng)
Business	-.23	-.34	-.17	-.24	.31(Sec) .35(Bus)	.44(Sec) .40(Bus)	.25(Sec) .50(Bus)	.52(Sec) .58(Bus)
Engineering	-.09	-.06	.05	-.03	.24(P Sci) .37 (Ind Art)	.21(P Sci) .31(Ind Art)	.27(P Sci) .36(Ind Art)	.18(P Sci) .28(Ind Art)
Home Economics/Health/ Physical Education	-.25	-.24	-.21	-.14	.14	.24	.17	.39
Applied Science	-.02	-.03	.03	.08	.37(Ind Art)	.29(Ind Art)	.36(Ind Art)	.21(Ind Art)

Table II-7

Multiple Correlations for Predicting Grade 13 Interests (1) from Grade 11 PSAT-V (2), PSAT-M (3), and AIM (4) and Grade 12 SI-1 (5)

Grade 13 Interest (1)	MALES				FEMALES			
	Col 1 R1.23	Col 2 R1.234	Col 3 R1.235	Col 4 R1.2345	Col 1 R1.23	Col 2 R1.234	Col 3 R1.235	Col 4 R1.2345
Biological Science	.09	.38	.52	.55	.07	.35	.48	.51
Physical Science	.13	.34	.42	.45	.14	.34	.38	.45
Mathematics	.28	.45	.59	.60	.44	.60	.66	.69
Social Science	.22	.40	.44	.48	.17	.26	.34	.37
Humanities	.25	.43	.44	.49	.25	.36	.41	.46
Art/Architecture	.08	.46	.49	.54	.12	.43	.48	.51
Education	.12	.18	.16	.19	.16	.17	.18	.21
Business	.23	.39	.51	.53	.33	.48	.60	.60
Engineering	.17	.44	.38	.47	.15	.32	.29	.37
Home Economics/Health/ Physical Education	.25	.27	.29	.30	.25	.31	.42	.44
Applied Science	.07	.37	.37	.43	.15	.31	.24	.32

five per cent random sample or grade 13 interests for those continuing their education past secondary school. Comparisons of multiple correlations in column 2 of Table II-7 with those in column 2 of Table II-4 for fields that seem to correspond (note that the order of fields differs for those different groups) show that when AIM is the independent interest variable, only interests in the field of mathematics for the males and social science, art and home economics for the females suffer a loss of 10 points or more in moving the predicted criteria from grade 12 to 13. Comparison of the multiple correlations for grade 12 interests with those for grade 13 using SI or SI-1 in place of grade 11 AIM (column 3 in Tables II-4 and II-7) shows a decrease by as much as 10 points in physical science, social science, and English-humanities interests for females and English-humanities interest for males. On the other hand, increases of similar size appear for social science and art for males. (The large increase in predictability of business interest for both sexes can be attributed to the change in nomenclature between grades 11 and 12--a change that did not occur between grades 12 and 13.)

In order to test out a possible moderating effect of type of school attended on the prediction of grade 13 interests, multiple correlations were computed for those responding A to item 3 of the College Questionnaire (attending four-year college) and those responding B or C (attending two-year college or technical institute), separately by sex. The differences between multiple correlations for the two-year and the four-year groups reach significance $(p = .01)$ for only two fields, for males only. The multiple correlations $(R\ 1.2345)$ in these two fields, social science and the composite home economics/health/physical education, are higher for males attending four-year colleges (.52 and .31, respectively) than for those attending two-year schools (.36 and .10, respectively). These differences are not attributable to restrictions of range; with the exception of PSAT-V, which plays a relatively minor role in the predictions, no significant differences were noted between these groups in the variances of the predictors or of the criteria.

It should be noted, of course, that the conglomerate Home Economics/Health/Physical Education for males is not, on logical grounds, likely to be well predicted by the AIM *Home Economics* scale or by the SI-1 rating on Home Economics interest.

Differential Prediction of Interests in Grades 12 and 13

Use of interests as criteria appears to provide more fertile opportunity for differential prediction than use of marks. For interests, unlike marks, intercorrelations both among actual criteria (Table II-8) and among predicted criteria (Table II-9) tend to be rather low. Indeed, 30 of the r_{ab} in Table II-8 are negative, as are 44 of the r_{a*b*} in Table II-9. (Once again, we can observe empirically the strong relationship between r_{ab} and r_{a*b*}, as plotted in Figure II-2.) Furthermore, problems associated with incomplete data, as discussed in connection with the prediction of differences in marks, are alleviated when predicting differences in interests, since students were asked to rate their interest in a subject field whether they were presently taking courses in that field or not.

Insert Tables II-8 and II-9 and Figure II-2 about here

Table II-8

Intercorrelations among Grade 13 Interests (SI-2)[a]

$\underline{r_{ab}}$

	Biological Science	Physical Science	Mathematics	Social Science	Humanities	Art/Architecture	Education	Business	Engineering	Home Economics/Health/ Physical Education	Applied Science
Biological Science	---	.42	.11	.09	.03	-.01	.01	-.12	.11	.11	.22
Physical Science	.41	---	.33	.03	-.04	.04	-.03	.03	.32	.13	.37
Mathematics	.06	.39	---	-.06	-.14	-.08	.03	.12	.28	.06	.24
Social Science	.09	-.04	-.16	---	.31	.11	.09	-.05	.02	-.03	.05
Humanities	.09	-.01	-.10	.46	---	.23	.19	-.09	-.04	-.06	.00
Art/Architecture	.10	.05	-.06	.07	.22	---	.08	-.01	.13	.06	.06
Education	.07	-.03	-.09	.24	.27	.20	---	.21	.03	.19	.04
Business	-.06	-.01	.10	.09	.00	.03	.24	---	.28	.25	.17
Engineering	.11	.39	.42	-.22	-.20	.14	-.10	.19	---	.15	.46
Home Economics/Health/ Physical Education	.13	.08	.08	-.10	-.07	.06	.20	.18	.22	---	.18
Applied Science	.22	.41	.26	-.14	-.14	.08	-.05	.08	.49	.25	---

[a] Males below the diagonal; females above.

Table II-9

Correlations among Grade 13 Interests Predicted from PSAT-V, PSAT-M, SI-1, and AIM[a]

$\underline{r_{a*b*}}$

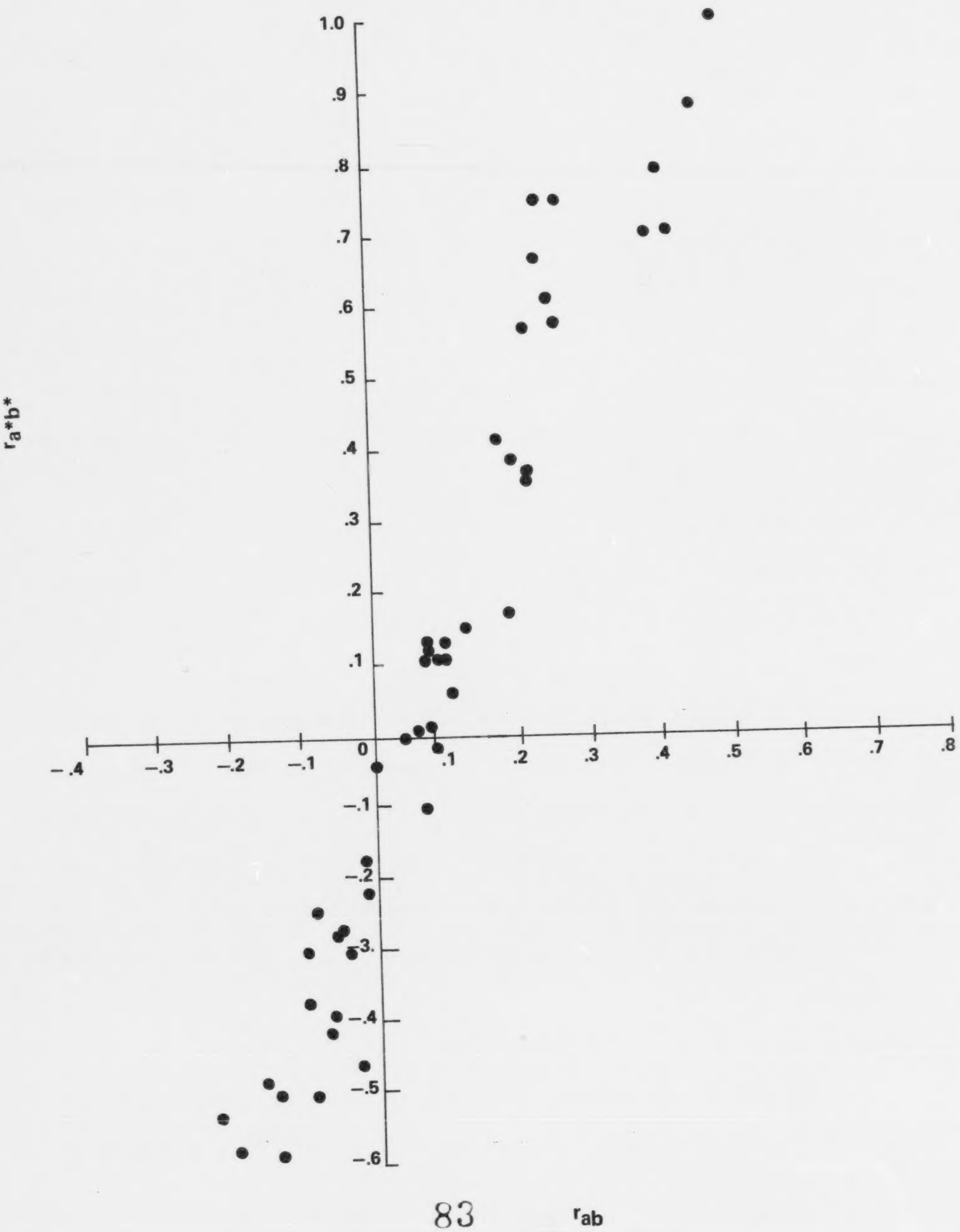
	Biological Science	Physical Science	Mathematics	Social Science	Humanities	Art/Architecture	Education	Business	Engineering	Home Economics/Health/ Physical Education	Applied Science
Biological Science	---	.67	.08	.21	-.07	-.07	-.40	-.30	.10	.05	.46
Physical Science	.65	---	.56	.00	-.29	.00	-.15	-.08	.68	.15	.86
Mathematics	.01	.64	---	-.34	-.37	-.20	-.07	.20	.61	.14	.68
Social Science	-.01	-.30	-.48	---	.66	.19	-.18	-.22	-.07	-.23	-.09
Humanities	.11	-.21	-.39	.88	---	.47	.22	-.25	-.23	-.35	-.28
Art/Architecture	.11	.00	-.24	.00	.37	---	-.24	-.16	.27	-.02	.26
Education	-.10	-.46	-.50	.75	.75	.35	---	.90	.20	.91	.07
Business	-.27	-.17	.13	.11	-.04	-.20	.67	---	.58	.62	.39
Engineering	.06	.70	.70	-.53	-.58	.15	-.30	.17	---	.48	.98
Home Economics/Health/ Physical Education	.15	.12	.13	-.37	-.41	.03	.39	.42	.57	---	.44
Applied Science	.36	.79	.58	-.50	-.58	.04	-.27	.01	1.00	.61	---

[a] Males below the diagonal; females above.

Figure II-2

Relationship between r_{ab} and r_{a*b*}

(From Tables II-9 and II-10, Males only)



Differential correlations for grades 12 and 13 interests are presented in Tables II-10 to II-16. At each grade level, these tables first give correlations for differential predictions based on PSAT-V and PSAT-M alone; successive tables add AIM, then students' own ratings of interests as predictors, and finally (for grade 13 only) all four predictors.

Looking first at Tables II-10 and II-13 we see that, in the main, abilities provide little in the way of predicting differences between interests in most subject fields, particularly for males. (For the males, 48 out of 55, or 87%, of the grade 13 correlations are less than .30; for females, 44, or 80%, are less than .30.) Adding AIM to the set of predictors increases differential prediction of interests considerably (Tables II-11 and II-14). This set of 11th-grade predictors provides differential validities which are typically in the .30's to .50's.

Replacing AIM with self-rated interest (Tables II-12 and II-15) brings about even greater increases in over half the correlations. AIM, however, is clearly superior to SI for differential predictions involving grade 12 interest in art. As can be seen from columns 2 and 3 in Tables II-4, this superiority is largely due to higher multiple correlations when AIM is used instead of SI to predict Art interest. When PSAT-V, PSAT-M, AIM, and SI-1 are combined as predictors (Table II-16), differential validities are generally in the .40's to low .60's (for the males 75% of the correlations are greater than .40; for the females 69% are greater than .40).

The findings for differential predictions of interests can be summarized as follows:

At grade 12:

1. For a test battery consisting of PSAT-V and PSAT-M, and either AIM or students' own ratings of interests (SI), differential

validities are generally in the range of .3 to .6 (Tables II-11 and II-12). Usually, slightly higher differential validities are found for the battery which includes SI in place of AIM.

2. Regardless of whether AIM or SI is used, poor differentiation of interests is noted between the following interest pairs for the males: secretarial-home economics, secretarial-business, and industrial arts-home economics; for the females, social studies-English and business-secretarial.

At grade 13:

1. Slightly higher differential validities are generally found for the battery which includes SI-1 (Table II-15) in place of AIM (Table II-14). The superiority of SI-1 over AIM is probably a function of testing time (grade 11 for AIM; grade 12 for SI-1).
2. For a test battery consisting of PSAT-V and PSAT-M, AIM and SI-1, differential validities are generally found in the range .4 to .6 (Table II-16).
3. The test battery shows serious limitations in differentiating interests in education from interests in most other fields. This is not surprising, however, since as already noted there is no interest predictor labeled "education."
4. For both sexes poorest differentiation is obtained between interests in the fields of applied science and engineering. This is true regardless of whether industrial arts or physical science interest is used in predicting applied science interest.

5. Discrimination between humanities and social science interests is relatively weak for both sexes.

Insert Tables II-10 through II-16 about here

Discriminating between Intended-Major-Field Groups

It is generally expected that the selection of a major field is related to high school interests. A scan of Tables II-17 and II-18, which give AIM means for intended-major-field groups (formed on the basis of responses to item 5 of the College Questionnaire filled out at the end of grade 13), lends support to this expectation.

With few exceptions, mean AIM scale scores tend to be highest for logically appropriate fields, both compared to other scales (looking across columns of the table) and compared to other fields (looking across rows). Furthermore, when tested by Mahalanobis' D^2, the profile of PSAT and AIM means for each major-field group of males (with the exception of Education) is significantly different $(p < .001)$ from the profile for all major-field groups of males.

Insert Tables II-17 and II-18 about here

To examine more fully how AIM and PSAT discriminate between major-field groups, a multiple discriminant analysis was carried out (for males only). The 12 intended-major-field groups used in the analysis are those listed in Table II-17.

Standardized coefficients for the first, second, and third discriminants are reported in Table II-19a. Composite discriminant scores were

Table II-10

Correlations for Differential Prediction of Grade 12 Interests Using PSAT-V and PSAT-M as Predictors[a]

	Biology	English	Art	Mathematics	Social Studies	Secretarial	Physical Sciences	Foreign Languages	Music	Industrial Arts	Home Economics	Business
Biology	---	.04	.05	.25	.12	.31	.06	.06	.12	.12	.29	.33
English	.06	---	.05	.27	.09	.36	.08	.04	.16	.16	.34	.40
Art	.15	.19	---	.29	.07	.32	.10	.09	.12	.15	.33	.35
Mathematics	.28	.31	.26	---	.35	.32	.23	.24	.33	.25	.29	.38
Social Studies	.01	.08	.14	.26	---	.43	.18	.12	.19	.22	.40	.44
Secretarial	.14	.19	.01	.27	.14	---	.31	.38	.28	.23	.03	.10
Physical Sciences	.22	.22	.28	.18	.19	.26	---	.07	.16	.13	.29	.34
Foreign Languages	.12	.10	.28	.34	.15	.27	.20	---	.20	.18	.33	.40
Music	.09	.14	.09	.26	.07	.07	.24	.22	---	.10	.28	.30
Industrial Arts	.25	.28	.13	.30	.23	.12	.34	.33	.18	---	.21	.26
Home Economics	.20	.25	.07	.25	.19	.08	.30	.31	.14	.07	---	.10
Business	.21	.25	.07	.26	.21	.08	.30	.31	.14	.06	.01	---

[a] Males below the diagonal; females above.

Table II-11

Correlations for Differential Prediction of Grade 12 Interests Using PSAT-V and PSAT-M and AIM as Predictors[a]

	Biology	English	Art	Mathematics	Social Studies	Secretarial	Physical Sciences	Foreign Languages	Music	Industrial Arts	Home Economics	Business
Biology	---	.34	.44	.51	.36	.57	.15	.41	.42	.31	.41	.53
English	.32	---	.47	.53	.20	.57	.28	.28	.38	.30	.43	.56
Art	.49	.47	---	.67	.49	.65	.45	.50	.51	.38	.48	.63
Mathematics	.44	.49	.59	---	.57	.59	.42	.53	.59	.38	.48	.59
Social Studies	.40	.28	.57	.51	---	.62	.36	.38	.43	.36	.48	.59
Secretarial	.32	.33	.43	.45	.32	---	.58	.59	.58	.51	.32	.16
Physical Sciences	.26	.34	.51	.39	.36	.36	---	.44	.45	.22	.40	.56
Foreign Languages	.36	.28	.52	.59	.32	.39	.36	---	.51	.42	.51	.61
Music	.44	.34	.45	.57	.49	.42	.44	.42	---	.37	.50	.60
Industrial Arts	.42	.60	.46	.54	.57	.31	.49	.56	.55	---	.34	.47
Home Economics	.37	.35	.42	.47	.41	.16	.40	.43	.41	.29	---	.36
Business	.40	.37	.52	.44	.38	.15	.44	.47	.53	.44	.36	---

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[a] Males below the diagonal; females above.

Table II-12

Correlations for Differential Prediction of Grade 12 Interests Using PSAT-V and PSAT-M and SI as Predictors[a]

	Biology	English	Art	Mathematics	Social Studies	Secretarial	Physical Sciences	Foreign Languages	Music	Industrial Arts	Home Economics	Business
Biology	---	.43	.44	.59	.32	.61	.36	.50	.52	.37	.54	.53
English	.51	---	.45	.58	.28	.60	.45	.39	.47	.35	.52	.52
Art	.42	.44	---	.60	.32	.57	.46	.43	.48	.34	.53	.48
Mathematics	.51	.50	.52	---	.57	.61	.51	.58	.62	.42	.50	.53
Social Studies	.40	.33	.39	.47	---	.64	.35	.40	.46	.34	.51	.53
Secretarial	.45	.40	.31	.48	.33	---	.64	.56	.57	.46	.45	.20
Physical Sciences	.36	.44	.44	.46	.37	.40	---	.49	.57	.38	.52	.53
Foreign Languages	.45	.38	.48	.57	.32	.44	.41	---	.55	.44	.56	.54
Music	.54	.47	.36	.60	.45	.43	.53	.49	---	.39	.52	.50
Industrial Arts	.41	.48	.25	.48	.40	.27	.44	.48	.50	---	.36	.33
Home Economics	.47	.45	.34	.55	.42	.17	.51	.47	.45	.25	---	.28
Business	.43	.46	.38	.46	.30	.23	.43	.47	.44	.32	.35	---

[a] Males below the diagonal; females above.

Table II-13

Correlations for Differential Prediction of Grade 13 Interests
Using PSAT-V and PSAT-M as Predictors[a]

	Biological Science	Physical Science	Mathematics	Social Science	Humanities	Art/Architecture	Education	Business	Engineering	Home Economics/Health/ Physical Education	Applied Science
Biological Science	---	.15	.34	.08	.14	.03	.19	.27	.14	.23	.14
Physical Science	.19	---	.26	.19	.25	.15	.14	.22	.04	.18	.02
Mathematics	.27	.16	---	.36	.41	.32	.33	.37	.27	.33	.23
Social Science	.10	.21	.31	---	.08	.05	.27	.35	.21	.29	.20
Humanities	.13	.21	.32	.06	---	.13	.32	.38	.27	.34	.26
Art/Architecture	.02	.13	.24	.10	.14	---	.23	.31	.17	.27	.15
Education	.08	.18	.26	.18	.22	.10	---	.11	.12	.05	.16
Business	.19	.22	.27	.31	.33	.21	.16	---	.22	.07	.25
Engineering	.20	.13	.14	.25	.27	.19	.17	.17	---	.15	.05
Home Economics/Health/ Physical Education	.32	.26	.30	.28	.32	.22	.15	.04	.21	---	.20
Applied Science	.12	.07	.18	.19	.20	.10	.12	.16	.11	.20	---

[a] Males below the diagonal; females above.

Table II-14

Correlations for Differential Prediction of Grade 13 Interests

Using PSAT-V, PSAT-M, and AIM as Predictors[a]

	Biological Science	Physical Science	Mathematics	Social Science	Humanities	Art/Architecture	Education	Business	Engineering	Home Economics/Health/ Physical Education	Applied Science
Biological Science	---	.22	.50	.30	.38	.39	.33	.47	.32	.34	.29
Physical Science	.28	---	.41	.32	.40	.41	.30	.46	.19	.34	.12
Mathematics	.43	.29	---	.52	.56	.56	.45	.53	.37	.46	.35
Social Science	.43	.45	.51	---	.21	.35	.28	.45	.32	.37	.32
Humanities	.41	.45	.53	.20	---	.32	.32	.49	.39	.41	.40
Art/Architecture	.45	.43	.51	.45	.42	---	.38	.52	.37	.42	.34
Education	.32	.36	.38	.24	.26	.35	---	.24	.26	.08	.26
Business	.44	.45	.42	.42	.44	.49	.26	---	.36	.26	.37
Engineering	.42	.29	.33	.49	.51	.46	.36	.45	---	.27	.05
Home Economics/Health/ Physical Education	.32	.32	.37	.40	.44	.40	.22	.26	.32	---	.28
Applied Science	.27	.21	.32	.47	.50	.45	.33	.41	.11	.29	---

[a] Males below the diagonal; females above.

Table II-15

Correlations for Differential Prediction of Grade 13 Interests Using PSAT-V, PSAT-M, and AIM as Predictors[a]

	Biological Science	Physical Science	Mathematics	Social Science	Humanities	Art/Architecture	Education	Business	Engineering	Home Economica/Health/ Physical Education	Applied Science
Biological Science	---	.34	.59	.38	.46	.50	.41	.59	.41	.48	.33
Physical Science	.38	---	.46	.37	.45	.43	.29	.53	.26	.39	.18
Mathematics	.57	.41	---	.58	.59	.61	.50	.60	.43	.53	.38
Social Science	.50	.48	.60	---	.25	.39	.30	.52	.34	.42	.33
Humanities	.46	.46	.59	.18	---	.37	.32	.54	.38	.47	.38
Art/Architecture	.49	.47	.60	.48	.39	---	.40	.58	.35	.47	.34
Education	.41	.36	.48	.28	.30	.36	---	.34	.20	.18	.19
Business	.57	.49	.55	.48	.49	.57	.33	---	.38	.30	.41
Engineering	.48	.29	.35	.48	.49	.43	.32	.44	---	.26	.08
Home Economics/Health/ Physical Education	.44	.37	.47	.41	.41	.41	.20	.36	.23	---	.27
Applied Science	.42	.27	.38	.48	.49	.43	.31	.46	.11	.23	---

[a] Males below the diagonal; females above.

Table II-16

Correlations for Differential Prediction of Grade 13 Interests Using PSAT-V, PSAT-M, AIM and SI-1 as Predictors[a]

	Biological Science	Physical Science	Mathematics	Social Science	Humanities	Art/Architecture	Education	Business	Engineering	Home Economics/Health/ Physical Education	Applied Science
Biological Science	---	.36	.61	.41	.50	.53	.43	.61	.45	.48	.37
Physical Science	.40	---	.49	.40	.49	.49	.35	.57	.28	.43	.20
Mathematics	.59	.43	---	.60	.63	.64	.52	.62	.45	.55	.41
Social Science	.55	.53	.62	---	.29	.43	.31	.53	.38	.43	.37
Humanities	.51	.52	.62	.24	---	.40	.34	.57	.44	.49	.44
Art/ Architecture	.54	.51	.62	.53	.47	---	.43	.61	.42	.50	.39
Education	.44	.41	.49	.29	.30	.40	---	.35	.28	.18	.27
Business	.59	.53	.56	.50	.52	.60	.34	---	.42	.40	.44
Engineering	.52	.34	.41	.54	.56	.51	.38	.51	---	.32	.08
Home Economics/Health/ Physical Education	.45	.38	.47	.44	.46	.45	.23	.38	.32	---	.24
Applied Science	.45	.28	.41	.53	.56	.51	.35	.50	.12	.29	---

[a] Males below the diagonal; females above.

Table II-17

PSAT and AIM Means for Intended-Major-Field Groups (Males)

Major Field Group	PSAT-V	PSAT-M	Bio	Eng	Art	Math	Soc Sci	Sec	P Sci	F Lang	Mus	Ind Art	Home Ec	Bus	N
Biological Science	45.2	48.0	23.9	14.6	13.3	19.5	18.8	13.4	24.0	17.2	14.1	20.6	11.3	16.3	155
Physical Science	47.0	53.3	21.3	14.3	12.1	24.2	18.7	13.2	25.4	16.2	13.2	21.8	11.4	15.9	104
Mathematics	42.9	54.1	17.3	12.7	12.5	26.4	15.2	15.2	22.2	17.6	12.6	20.1	11.7	17.1	72
Social Science	46.6	49.3	16.1	18.4	13.7	16.7	23.0	14.0	19.2	17.7	14.7	17.8	10.9	18.9	301
Humanities	51.1	51.2	15.0	22.0	16.0	17.5	22.6	13.4	18.4	20.4	16.6	16.6	10.9	17.7	81
Art/ Architecture	40.3	43.4	15.8	14.1	19.6	15.9	15.0	14.1	17.5	14.4	16.9	20.5	11.4	14.5	100
Education	39.3	44.8	17.0	13.6	13.7	16.2	16.8	15.1	18.1	13.9	11.6	17.9	13.9	17.0	56
Business	37.8	43.7	16.5	13.3	12.8	19.0	17.8	18.1	18.9	14.1	12.2	20.5	12.3	20.7	318
Engineering	43.7	51.8	17.3	10.9	13.1	23.4	15.9	14.2	23.3	13.1	11.7	25.2	11.0	17.0	250
Home Economics/ Health/Physical Education	33.4	37.6	16.5	12.8	11.6	17.4	17.2	13.5	17.8	12.5	11.8	18.1	11.0	16.1	42
Agriculture	40.3	45.3	20.4	11.0	12.4	17.0	17.3	15.4	20.4	14.3	12.4	23.3	13.6	16.3	36
Applied Science	37.1	41.3	16.8	9.2	11.7	18.4	14.8	16.4	21.3	10.2	10.7	24.7	12.1	17.0	59

Table II-18

PSAT and AIM Means for Intended-Major-Field Groups (Females)

Major Field Group	PSAT-V	PSAT-M	Bio	Eng	Art	Math	Soc Sci	Sec	P Sci	F Lang	Mus	Ind Art	Home Ec	Bus	N
Biological Science	46.5	47.0	24.4	20.5	19.7	18.7	20.3	15.6	20.7	23.1	19.9	12.4	23.3	14.3	121
Mathematics	47.0	54.3	16.5	18.8	19.2	27.5	17.8	19.0	16.5	23.2	16.3	13.8	23.4	17.8	82
Social Science	46.5	45.6	16.8	22.0	19.6	14.9	21.8	17.6	14.3	23.8	18.6	11.4	22.9	16.9	326
Humanities	48.1	45.6	14.6	24.9	22.2	13.5	21.4	16.7	12.6	27.2	19.2	10.0	22.2	15.9	229
Art/ Architecture	45.0	45.5	15.5	21.8	25.4	13.7	17.0	15.5	13.4	23.3	21.7	13.4	22.8	14.4	170
Education	40.9	44.4	15.6	20.9	19.7	14.2	18.7	20.3	11.9	23.1	17.6	10.0	25.3	17.6	425
Business	36.2	37.6	14.9	17.9	19.2	14.3	15.5	25.4	11.1	21.0	16.4	11.5	25.8	20.4	261
Home Economics/ Health/Physical Education	41.4	41.7	19.1	19.0	19.7	15.1	17.9	19.9	14.6	21.6	17.7	11.8	26.4	17.2	291

obtained by multiplying the vector of standardized discriminant coefficients by the vector of standardized test scores. In order to help define the nature of the discriminant functions, correlations between PSAT, AIM, and the composite are given in Table II-19b. As can be seen in the latter table, the variables related positively to the first discriminant are English, Social Science, PSAT-V, Foreign Language, and Music; those negatively related are Industrial Arts, Mathematics, and to a lesser extent Physical Science. The first discriminant can thus be construed as a continuum from verbal interests and ability to applied scientific and mathematical interests. The variables related positively to the second discriminant are PSAT-M, PSAT-V, Physical Science, Mathematics and Biology; moderate negative relationships are noted with Secretarial and Business. The second discriminant can be conceptualized as a scholastic ability and scientific interest vs. business interest dimension. The third discriminant, defined by a high negative relationship with Biology and a moderate positive relationship with PSAT-M, PSAT-V, Mathematics, and English, does not seem so readily interpretable as the first two.

Insert Table II-19 about here

A measure of the discriminating power of the test battery is afforded by the canonical correlation between the linear combination of the 14 test scores and group membership. The canonical correlations for the first three discriminants are .51, .42, and .32, respectively. Thus, the first discriminant accounts for approximately 26 per cent of the variance common to a linear combination of both sets of variables; the second discriminant accounts for about 18 per cent of the common variance; and the third

Table II-19

Discriminant Analysis of PSAT and AIM for Intended-Major-Field (Males)

(a) Standardized Discriminant Function Coefficients

	I	II	III
PSAT-V	0.321	0.267	-0.134
PSAT-M	-0.151	0.350	0.487
AIM Bio	0.221	0.208	-1.008
Eng	0.488	0.070	0.140
Art	0.225	-0.089	0.203
Math	-0.469	0.184	0.255
Soc Sci	0.228	-0.017	0.056
Sec	-0.154	-0.201	-0.051
P Sci	-0.272	0.397	0.111
F Lang	0.086	0.170	-0.025
Mus	0.106	0.031	-0.054
Ind Art	-0.345	-0.068	0.134
Home Ec	-0.106	0.045	-0.095
Bus	0.106	-0.517	0.255

(b) Correlations between PSAT and AIM and Composite Discriminant Scores

	I	II	III
PSAT-V	0.323	0.658	0.300
PSAT-M	-0.018	0.671	0.486
AIM Bio	-0.091	0.364	-0.644
Eng	0.607	0.130	0.221
Art	0.177	-0.032	0.087
Math	-0.399	0.384	0.238
Soc Sci	0.429	0.097	0.127
Sec	-0.121	-0.380	0.043
P Sci	-0.238	0.459	-0.160
F Lang	0.304	0.244	0.076
Mus	0.259	0.090	0.015
Ind Art	-0.425	0.102	0.003
Home Ec	-0.047	-0.103	-0.091
Bus	0.045	-0.273	0.198

discriminant accounts for about 10 per cent of the common variance. In view of these modest canonical correlations, the test battery of grade 11 PSAT and AIM scores can be said to have rather limited capabilities in discriminating all the intended-major-field groups from one another.

The major results of the discriminant analysis are shown in Figure II-3. In this figure the horizontal axis represents the first discriminant and the vertical axis represents the second discriminant. The variables contributing most to discrimination are listed at the poles of each axis, with their standardized coefficients in parentheses. The scale can be interpreted like a standard-score scale.

The first discriminant in Figure II-3 separates the 12 groups roughly into three clusters. Humanities and Social Sciences at the high end are characterized by high verbal ability and English interest scores; Applied Science, Engineering, Mathematics, and Physical Science at the low end are characterized by high Mathematics and Industrial Arts scores. The remaining groups are located in the middle (Business, Home Ec/Health/Physical Education, Agriculture, Education, Biology, and Art/Architecture).

As illustrated in this figure, the second discriminant separates a number of the groups not differentiated on the first discriminant. Thus, for example, the Applied Science and Engineering groups, which have identical scores on the first discriminant are separated quite effectively by the second discriminant.

The intended-major-field groups Agriculture, Education, and Art/Architecture, however, are not readily differentiated from one another; neither is Business differentiated from Home Economics/Health/Physical Education, Engineering from Mathematics, nor Social Sciences from Humanities.

In short, the discriminant analysis does not seem to provide information of great utility. Although the first two discriminants make psychological (and educational) "sense," there is considerable overlap between intended-major-field groups. For example, maximum discrimination on the first discriminant is obtained between the groups Humanities and Engineering (and Applied Science). A difference in score of about 1.8 between these groups indicates an overlap of approximately 37 per cent. Greater overlap is likely between any other groups. Furthermore, we must recognize that intended-major-field is at best an intermediate criterion. We know that many students change their major-field plans during their sophomore year. We have no way of knowing whether AIM and PSAT are better or worse predictors of actual major-field entered in junior year than of intentions at the end of freshman year.

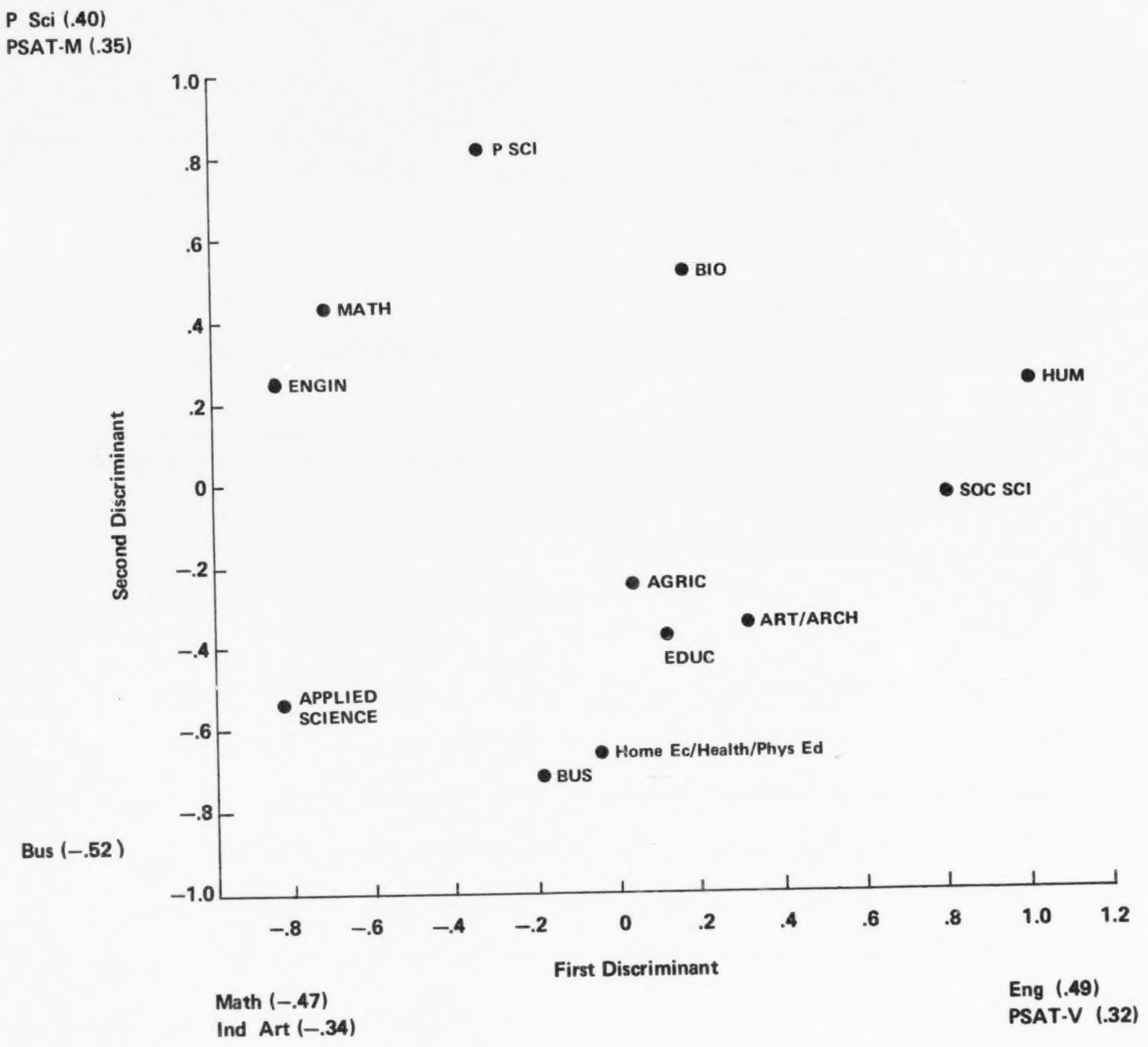
Insert Figure II-3 about here

Values as discriminants of intended-major-field. On logical grounds, values may also be expected to discriminate between some intended-major-field groups. The College Questionnaire asked students to rate the importance of 12 occupational values on an 11-point scale, from 0 to 10. (See items 92-103 of the questionnaire for the complete name of each value.) As will be discussed in the following chapter on the structure of abilities, interests, and values, these values were found to constitute a domain relatively independent of interests and abilities. This set of variables, therefore, seemed worth at least some cursory examination for usefulness in discriminating between the intended-major-field groups. While a discriminant analysis incorporating values was not carried out, a presentation of means for intended-major-field groups on each of the values may be enlightening.

Figure II-3

Plot of Intended Major Field Groups (Males)

in the Discriminant Space



Tables II-20 and II-21 show the intended-major-field group means and the total grade 13 sample mean and standard deviation for each of 12 occupational values. Only groups having 50 or more members were included in this analysis.

In the total sample of grade 13 males and females, "sense of accomplishment, pride in work" and "interest in the work activities" were the highest rated occupational values and "prestige, looked up to by others" and "leisure time" were the lowest rated values. All of the values, however, tend to appear at least moderately important, on the average, and the standard deviations show that individuals vary considerably on nearly every one of them.

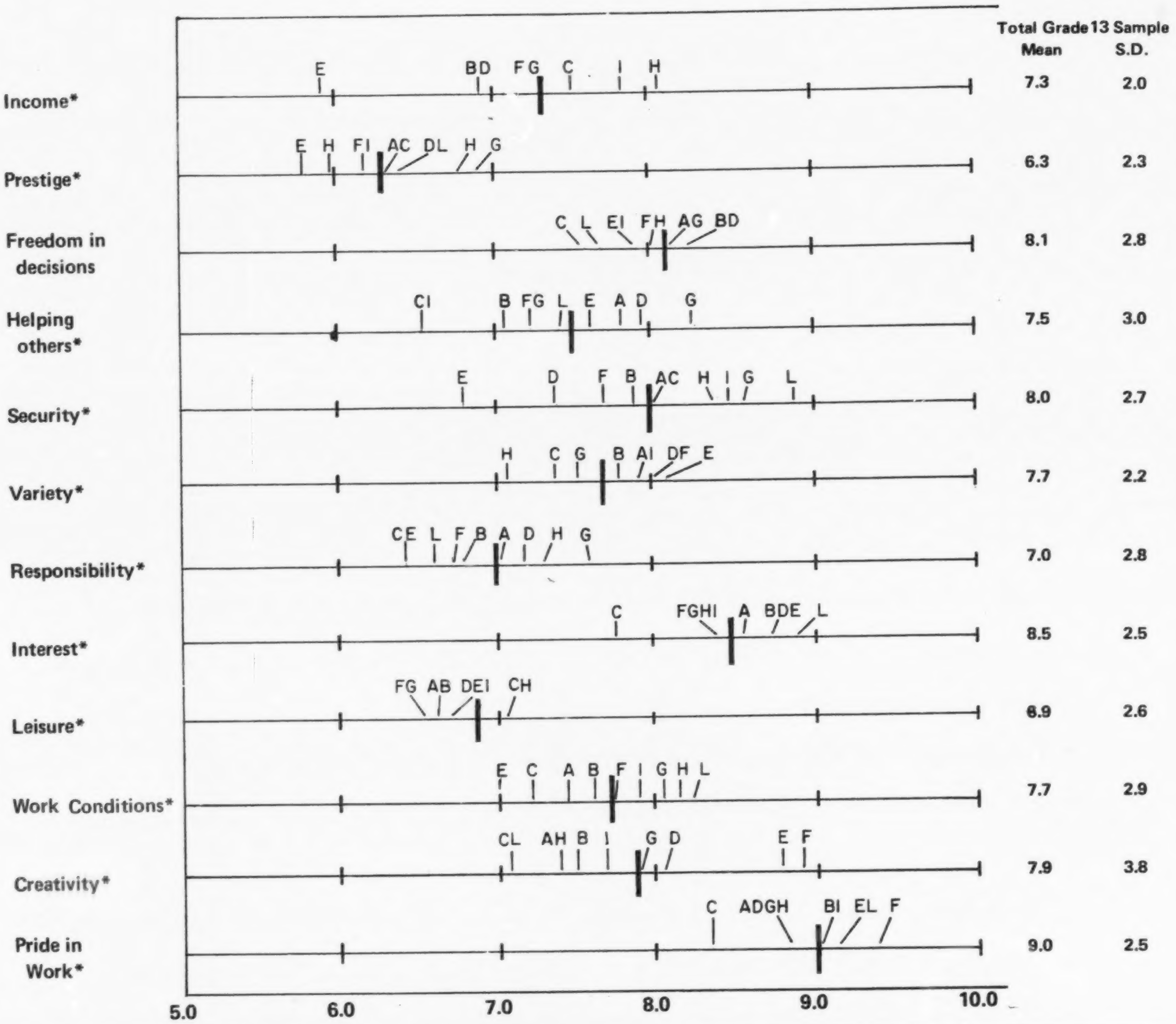
Insert Tables II-20 and II-21 about here

Here, again, the differentiations make psychological (and educational) "sense." Students who intend to major in art/architecture tend to place high importance on the values called "Creativity, expression of ideas" and "Sense of accomplishment, pride in work." These values are least important to males who expect to major in mathematics or applied science and to females who expect to major in business or home economics/health/physical education.

"Helping others" and "Leadership, responsibility for others" are most important to prospective majors in education. Among the males, the former value is least important to would-be mathematicians and engineers, and the latter is least important to those who expect to major in mathematics or humanities. Among the females, both of these values are least important to prospective art/architecture majors, with intended business majors also

Table II-20

Occupational Value Means for Intended-Major-Field Groups (Males)



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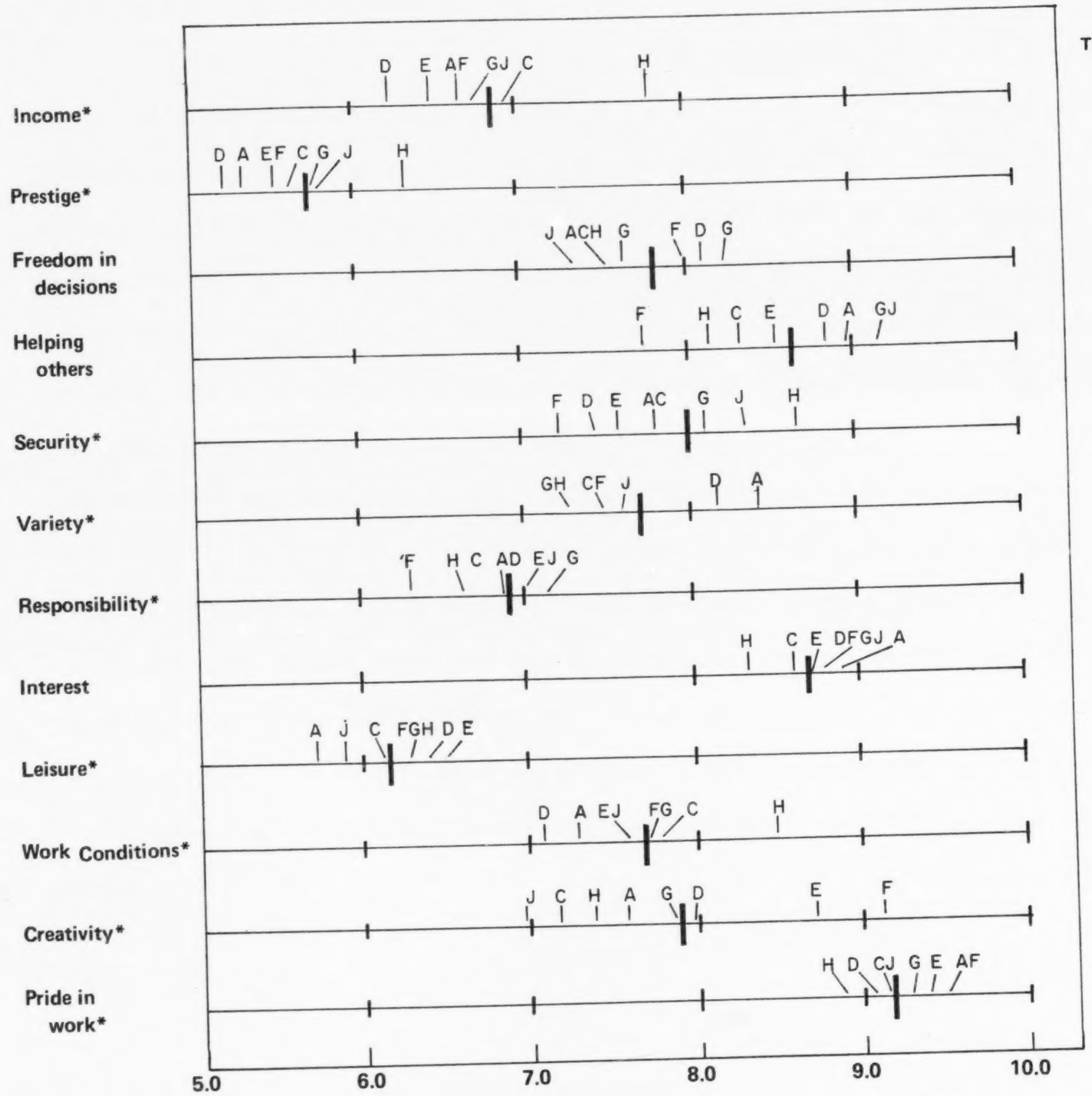
*differences among group means significant at $p < .01$.

A = Biological Science
B = Physical Science
C = Mathematics
D = Social Science
E = Humanities
F = Art/Architecture
G = Education
H = Business
I = Engineering
L = Applied Science

Table II-21

Occupational Value Means for Intended-Major-Field Groups (Females)



Total Grade 13 Sample Mean	S.D.
6.8	2.2
5.7	3.1
7.8	2.9
8.6	1.8
8.0	3.4
7.7	2.3
6.9	2.5
8.7	1.7
6.2	2.3
7.7	2.1
7.9	2.5
9.2	1.3

---

*Differences among group means significant at $p < .01$.

A = Biological Science
B = Physical Science
C = Mathematics
D = Social Science
E = Humanities
F = Art/Architecture
G = Education
H = Business
I = Engineering
J = Home Economics/Health/

rating them relatively low. It is certainly not surprising to find that "Money, income" is rated highest by students who plan to major in business, with prospective humanities and social science majors rating it relatively low.

Several of the values appear to have potential for increasing the discrimination between groups not readily differentiated in the discriminant space by PSAT and AIM. The value variable "income," for example, provides a separation of about one-half a standard deviation between the group means for males who expect to major in humanities and those who expect to major in social science. Several of the values provide a separation of at least .2 to .3 standard deviations (and sometimes much more) between group means for intended engineers and mathematicians and for intended art/architecture and education majors.

It should be noted that the data on values were collected concurrently with intended-major-field designations and therefore cannot qualify as predictors of intended-major-field. The present findings, however, suggest that values may make a unique contribution to discriminating major-field groups and that this contribution should be explored more thoroughly in future research.

III: THE STRUCTURE OF ABILITIES, INTERESTS, AND VALUES

Data collected for the norming and validation of PSAT and AIM afforded an excellent opportunity to investigate the nature of academic interests--their structure, their developmental trends, and relationships with other variables. The value of this investigation, though somewhat peripheral to the major objectives of the study, lies in its contribution to a comprehensive theory of interests.

Part I of this study (Katz, Norris, and Halpern, 1970) reported a five-factor solution of a maximum likelihood analysis of PSAT and AIM based on the entire grade 11 sample. Four interest factors and one ability factor were identified, as follows:

Factor I	Ability
Factor II	Business Interest
Factor III	Nonacademic Interest for Males Mathematics Interest for Females
Factor IV	Science Interest
Factor V	Liberal Arts Interest

Similar findings were reported in a study of the factor structure of core elements of the College Entrance Examination Board Comparative Guidance and Placement Battery, comprising eight aptitude and achievement tests and 12 interest scales derived from a modified version of AIM (Lunneborg, Greennum and Lunneborg, 1969). In this study, which used data collected from 687 students entering community colleges in Washington, the six factors emerging from a principal components factor analysis were Verbal, Scientific, Business, and Fine Arts Interest, and Verbal and Mechanical Aptitude.

The present study focuses on three major topics:

(1) Comparisons between the factor structure of inventoried interests (AIM) and students' ratings of interests (SI).

(2) Developmental trends from grades 11 to 12 and 12 to 13.

(3) The structure of interests, abilities, and values.

Throughout this report, the type of factor analysis employed is an unrestricted maximum likelihood factor analysis (UMLFA) described by Jöreskog (1967). It should be noted that while a test of the maximum likelihood solution is provided (chi-square test of goodness of fit), this test cannot be relied on to indicate when an appropriate number of factors has been extracted, particularly when samples are very large. As always, interpretation of factors must weigh heavily in deciding the appropriate number of factors. For this reason, chi-square probabilities for the factor solutions are not reported.

Factor Structures of AIM and SI

To examine the factor structure of inventoried interests (AIM) and students' ratings of interests (SI) without introducing a time factor to confound the picture, it was necessary to use data from a five per cent random sample. (While the entire grade 11 sample took AIM, only a five per cent random sample of grade 11 students took a form of the Student Questionnaire which included interest ratings.) Data collected from members of this five per cent sample who also completed a questionnaire at the end of grade 12 provide the basis for the present analysis. (The inclusion of grade 12 measures is necessary for the later examination of developmental trends.)

Five-factor solutions resulting from an UMLFA performed on intercorrelations among PSAT and AIM and intercorrelations among PSAT and SI are presented in Tables III-1 and III-2.

Insert Tables III-1 and III-2 about here

Table III-1

Maximum Likelihood Solution for AIM and PSAT (5% Sample)

(Varimax-Rotated Factor Matrix)

Males

	I	II	III	IV	V
Bio	0.033	0.116	0.183	0.643	0.159
Eng	0.152	0.169	0.051	0.079	0.864
Art	-0.077	0.087	0.623	0.113	0.370
Math	0.377	0.257	0.096	0.291	0.135
Soc Sci	0.140	0.343	-0.276	0.213	0.625
Sec	-0.076	0.730	0.271	0.120	0.062
P Sci	0.147	0.183	0.112	0.942	0.212
F Lang	0.201	0.159	0.176	0.142	0.595
Mus	-0.015	0.000	0.309	0.132	0.588
Ind Art	-0.073	0.248	0.581	0.365	-0.126
Home Ec	-0.084	0.450	0.469	0.133	0.283
Bus	0.015	0.872	0.015	0.209	0.296
PSAT-V	0.748	-0.140	-0.160	0.050	0.248
PSAT-M	0.997	-0.029	-0.056	0.035	0.005

Females

	I	II	III	IV	V
Bio	0.035	0.010	0.090	0.733	0.096
Eng	0.064	0.014	0.110	0.014	0.803
Art	0.075	-0.002	0.427	0.030	0.328
Math	0.312	0.219	0.209	0.322	0.150
Soc Sci	0.087	-0.000	0.027	0.191	0.748
Sec	-0.144	0.882	-0.101	-0.137	-0.118
P Sci	0.107	0.024	0.182	0.903	0.266
F Lang	0.160	0.059	0.026	0.112	0.590
Mus	0.035	0.042	0.223	0.148	0.601
Ind Art	0.045	0.126	0.938	0.309	0.083
Home Ec	-0.074	0.539	0.112	0.057	0.033
Bus	-0.068	0.785	0.064	0.138	0.176
PSAT-V	0.693	-0.331	0.013	0.068	0.252
PSAT-M	0.982	-0.134	0.071	0.078	0.077

Table III-2

Maximum Likelihood Solution for SI and PSAT (5% Sample)

(Varimax-Rotated Factor Matrix)

Males

	I	II	III	IV	V
Bio	0.086	0.031	0.198	0.390	0.043
Eng	-0.079	0.126	0.014	0.395	0.225
F Arts	-0.003	0.080	0.100	0.125	0.329
Math	0.142	-0.027	0.584	0.173	0.010
Soc Sci	0.089	0.075	-0.003	0.628	0.035
Sec	-0.098	0.573	0.056	0.155	0.070
P Sci	0.146	-0.005	0.288	0.472	0.020
F Lang	0.179	0.166	0.127	0.396	0.274
Mus	-0.014	0.081	0.046	0.056	0.813
Engin	-0.092	0.050	0.465	0.062	0.130
Home Ec	-0.105	0.772	-0.010	0.063	0.163
Exec	0.100	0.142	0.217	0.260	0.116
PSAT-V	0.768	-0.227	-0.113	0.280	0.034
PSAT-M	0.975	-0.074	0.191	0.068	-0.052

Females

	I	II	III	IV	V
Bio	0.097	-0.227	0.069	0.565	0.021
Eng	0.005	0.075	0.065	0.044	0.218
F Arts	0.087	-0.059	-0.052	0.086	0.499
Math	0.146	0.106	0.506	0.174	-0.021
Soc Sci	0.000	0.026	0.065	0.540	0.166
Sec	-0.348	0.367	0.193	-0.154	-0.002
P Sci	0.101	0.024	0.194	0.689	0.118
F Lang	0.062	-0.192	0.171	0.049	0.329
Mus	-0.057	0.125	0.083	0.077	0.623
Engin	0.002	-0.081	0.591	0.143	0.173
Home Ec	-0.193	0.708	0.047	-0.050	0.100
Exec	-0.251	0.147	0.372	0.000	0.132
PSAT-V	0.760	-0.267	0.142	0.142	0.149
PSAT-M	0.973	-0.065	0.217	0.040	0.033

Before proceeding with a discussion of these tables, a comparison of the factor structure emerging from this sample with that emerging from the total grade 11 sample is appropriate. Since the only differences between the two samples are ones arising as a result of student dropout and other nonrandom losses in the sample from grades 11 to 12 (about an 18 per cent loss considering only complete data cases) the factor solutions for both samples are expected to be similar--and they are. In the main, only minor differences are noted, with Factor III for females providing the one exception. In the present solution, this factor maintains its identity for both sexes, being adequately labeled Nonacademic Interest, a label which was applied to the corresponding factor for males in the grade 11 solution.

To facilitate comparisons between solutions based on AIM and SI, summary sketches of the factor loadings from Tables III-1 and III-2 are presented in Figures III-1 and III-2. Included in the sketch for each factor are variables having highest loadings (usually equal to or greater than .40).

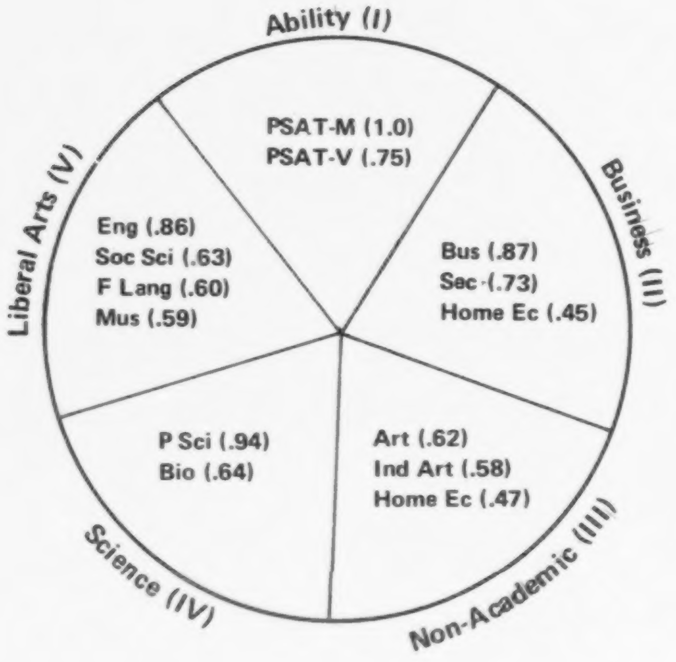
Insert Figures III-1 and III-2 about here

Probably the point that stands out most in these figures is the similarity in structure for males and females regardless of whether interests are measured by AIM or SI. A few differences are noted, however, between factor structures for AIM and SI. For males, for example, Factor IV in the AIM solution is apparently Science Interest, while in the SI solution the label Academic Interest appears more appropriate. For females, however, the label Science Interest does appear to be appropriate for Factor IV in both the AIM and SI solutions. Factor III, which changes in nature somewhat from the AIM to the SI analysis, with the appearance of mathematics and the disappearance of art

Figure III-1

Summary of UMLFA for AIM and PSAT (from Table III-1)

MALES


Ability (I)
PSAT-M (1.0)
PSAT-V (.75)
Business (II)
Bus (.87)
Sec (.73)
Home Ec (.45)
Non-Academic (III)
Art (.62)
Ind Art (.58)
Home Ec (.47)
Science (IV)
P Sci (.94)
Bio (.64)
Liberal Arts (V)
Eng (.86)
Soc Sci (.63)
F Lang (.60)
Mus (.59)

FEMALES

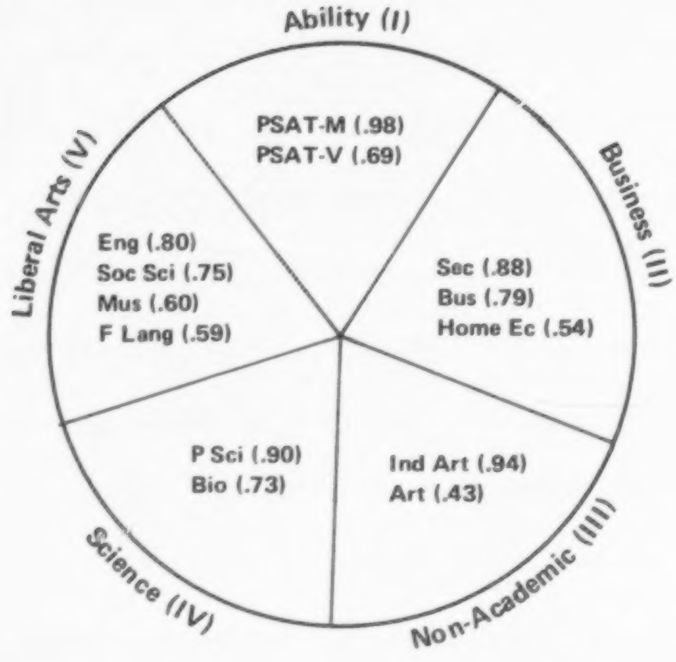
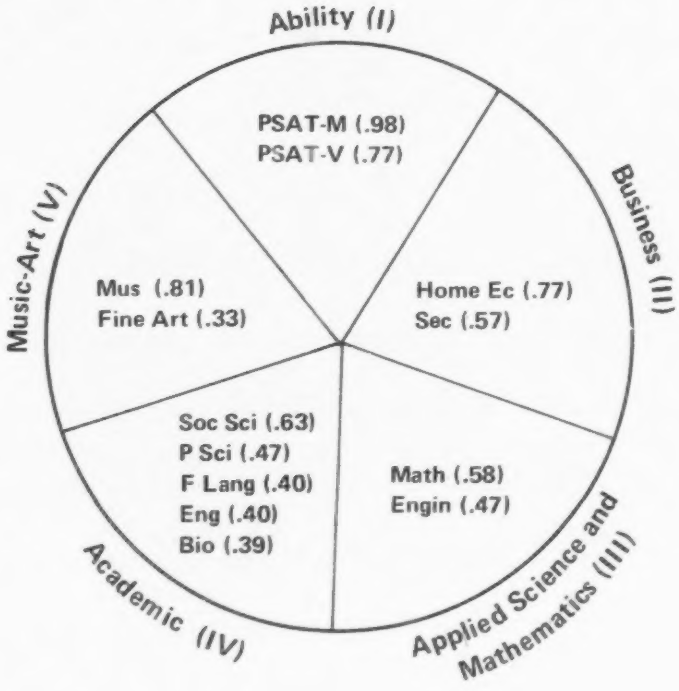

Ability (I)
PSAT-M (.98)
PSAT-V (.69)
Business (II)
Sec (.88)
Bus (.79)
Home Ec (.54)
Non-Academic (III)
Ind Art (.94)
Art (.43)
Science (IV)
P Sci (.90)
Bio (.73)
Liberal Arts (V)
Eng (.80)
Soc Sci (.75)
Mus (.60)
F Lang (.59)

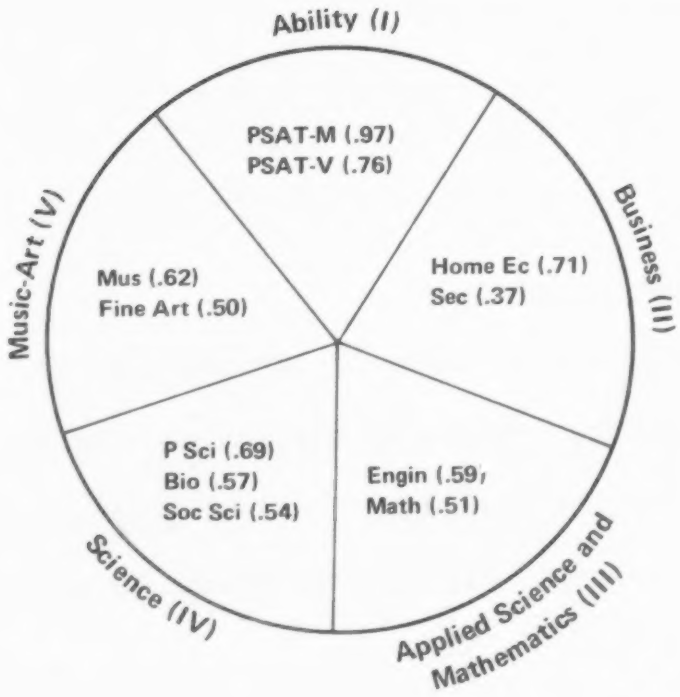
Figure III-2

Summary of UMLFA for SI and PSAT (from Table III-2)

MALES


Ability (I)
PSAT-M (.98)
PSAT-V (.77)
Business (II)
Home Ec (.77)
Sec (.57)
Applied Science and Mathematics (III)
Math (.58)
Engin (.47)
Academic (IV)
Soc Sci (.63)
P Sci (.47)
F Lang (.40)
Eng (.40)
Bio (.39)
Music-Art (V)
Mus (.81)
Fine Art (.33)

FEMALES


Ability (I)
PSAT-M (.97)
PSAT-V (.76)
Business (II)
Home Ec (.71)
Sec (.37)
Applied Science and Mathematics (III)
Engin (.59)
Math (.51)
Science (IV)
P Sci (.69)
Bio (.57)
Soc Sci (.54)
Music-Art (V)
Mus (.62)
Fine Art (.50)

from the picture, still maintains the flavor of nonacademic interest or perhaps interest in applied science and mathematics. (It will be recalled that SI used "Engineering" to correspond to the AIM scale now called Industrial Arts.) Factor V clearly goes from Liberal Arts Interest in the AIM solution to Music-Art Interest in the SI solution.

A close look at the factor matrices will undoubtedly suggest many other differences. It is left to the interested reader to explore them. Suffice it for the present to note some of the major differences and to suggest that despite these differences, similarities in factor structure lend support to a view of self-rated interests as appropriate stand-ins for inventoried interests.

Incidentally, separate factor analyses carried out on grade 11 PSAT and AIM intercorrelations for males identified on the basis of later data as school-going and nonschool-going (Table III-3) indicate that, with the possible exception of Factor V, the structure of interests and abilities is fundamentally the same for both groups. Factor V, Liberal Arts Interest, shows some relatively minor but interesting differences. For the school-going males, Factor V includes a sizeable loading on PSAT-V, but--unlike the solution for the nonschool-going males--does not include sizeable loadings on Art and Home Economics.

Insert Table III-3 about here

Developmental Trends in Interest

In addition to grade 11 interest ratings for the five per cent sample, grade 12 interest ratings were also available. The availability of similar interest measures for the same sample at two points in time made possible a study of the developmental nature of interests by allowing for direct comparisons

Table III-3

Maximum Likelihood Solution for AIM and PSAT for School-Going and Nonschool-Going Males (Varimax-Rotated Factor Matrix)

School-Going Males

	I	II	III	IV	V
Bio	-0.031	0.022	0.106	0.646	0.054
Eng	0.110	0.082	0.295	-0.059	0.809
Art	-0.062	0.115	0.677	0.127	0.146
Math	0.352	0.210	0.031	0.449	0.015
Soc Sci	0.062	0.162	-0.058	0.053	0.707
Sec	-0.125	0.730	0.196	0.050	0.020
P Sci	0.084	0.015	0.046	0.982	0.163
F Lang	0.123	0.087	0.274	0.083	0.532
Mus	0.011	0.050	0.463	0.085	0.372
Ind Art	0.001	0.226	0.349	0.550	-0.256
Home Ec	-0.096	0.451	0.416	0.204	0.096
Bus	-0.009	0.885	-0.033	0.107	0.378
PSAT-V	0.689	-0.226	-0.036	0.012	0.301
PSAT-M	0.994	-0.049	-0.059	0.074	0.020

Nonschool-Going Males

	I	II	III	IV	V
Bio	-0.050	0.133	0.099	0.597	0.184
Eng	0.117	0.155	0.133	0.045	0.841
Art	-0.046	0.099	0.709	0.110	0.359
Math	0.360	0.304	0.087	0.267	0.170
Soc Sci	0.085	0.266	-0.063	0.236	0.664
Sec	-0.099	0.819	0.162	0.045	0.197
P Sci	0.148	0.065	0.154	0.922	0.253
F Lang	0.101	0.195	0.115	0.212	0.643
Mus	0.030	0.140	0.322	0.116	0.561
Ind Art	0.049	0.242	0.516	0.437	-0.097
Home Ec	-0.072	0.443	0.361	0.245	0.360
Bus	0.005	0.807	0.072	0.208	0.344
PSAT-V	0.730	-0.142	-0.071	0.039	0.151
PSAT-M	0.999	0.010	0.025	-0.028	-0.009

between factor solutions for students' ratings of their own interests in grade 11 (SI) and similar ratings in grade 12 (SI-1).

Factor solutions based on intercorrelations among PSAT and SI-1 are presented in Table III-4; corresponding factor solutions for grade 11 interests (SI) have already been presented in Table III-2. As before, summary sketches have been prepared (Figure III-3).

Insert Table III-4 and Figure III-3 about here

Comparisons between the figures for grade 11 and grade 12 may suggest that interest patterns are still being formulated during this period. Some of the differences in factor loadings noted in the two solutions, however, can be attributed to changes in the titles of interests being rated. These changes (which correspond to changes in AIM scale titles) are given below.

Grade 11	Grade 12
Fine Arts	Art
Engineering	Industrial Arts
Executive	Business

The changes in interest titles would seem to account for differences in the nature of Factors III and V at grades 11 and 12. Whereas engineering loads with mathematics at grade 11, industrial arts loads with music and art at grade 12. Evidence that this shift represents the change in titles rather than any real change in interest patterns can be found in the similarity of the grade 12 SI-1 solution to the grade 11 AIM solution. In both, Factor V emerges as Liberal Arts or Verbal Interest and Factor IV as Science Interest.

All told, the structure of grade 12 interests (SI-1) seems to bear a closer resemblance to grade 11 interests measured by AIM than to grade 11 interests measured by a similar rating (SI).

Table III-4

Maximum Likelihood Solution for SI-1 and PSAT (5% Sample)

(Varimax-Rotated Factor Matrix)

Males

	I	II	III	IV	V
Bio	0.015	0.093	0.097	0.574	0.182
Eng	0.065	0.065	0.034	0.301	0.517
Art	-0.036	0.041	0.740	0.110	0.224
Math	0.195	0.295	0.013	0.331	-0.025
Soc Sci	0.025	0.063	0.027	0.442	0.267
Sec	-0.006	0.629	0.108	-0.027	0.220
P Sci	0.218	0.088	0.082	0.598	0.173
F Lang	0.173	0.059	0.057	0.352	0.542
Mus	0.016	0.164	0.400	0.132	0.463
Ind Art	0.144	0.265	0.398	0.030	-0.194
Home Ec	0.066	0.561	0.147	0.081	0.087
Bus	0.101	0.493	-0.016	0.225	-0.068
PSAT-V	0.747	-0.145	-0.103	0.127	0.241
PSAT-M	0.985	-0.046	-0.050	0.158	-0.024

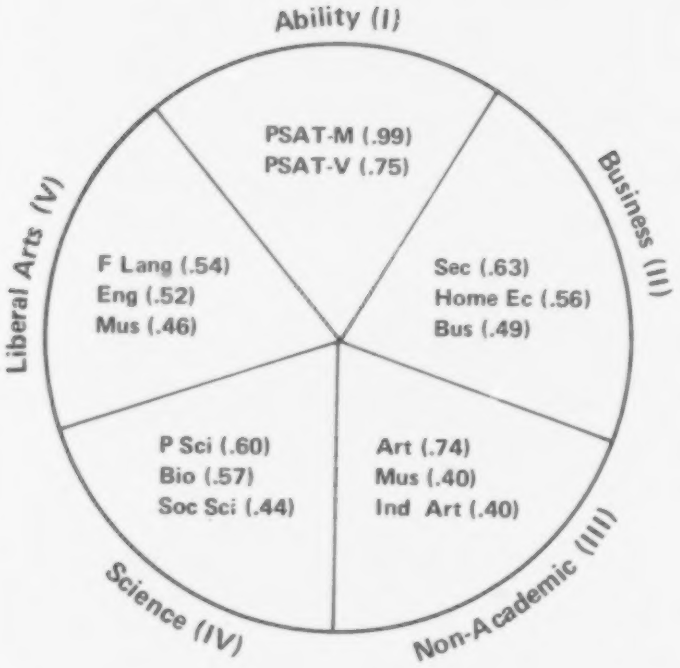
Females

	I	II	III	IV	V
Bio	0.075	-0.142	0.071	0.413	0.152
Eng	0.129	0.017	0.272	0.036	0.421
Art	0.092	-0.169	0.454	0.031	0.147
Math	0.266	0.236	0.178	0.357	-0.047
Soc Sci	0.089	0.020	0.076	0.201	0.516
Sec	-0.050	0.782	-0.041	-0.022	0.065
P Sci	0.039	0.058	0.078	0.862	0.195
F Lang	0.164	0.021	0.280	0.138	0.473
Mus	-0.052	0.129	0.561	0.081	0.361
Ind Art	0.008	0.184	0.396	0.273	0.062
Home Ec	-0.063	0.396	0.308	0.110	-0.126
Bus	-0.118	0.897	0.010	-0.037	0.037
PSAT-V	0.645	-0.297	0.016	0.068	0.258
PSAT-M	0.964	-0.111	0.034	0.150	0.186

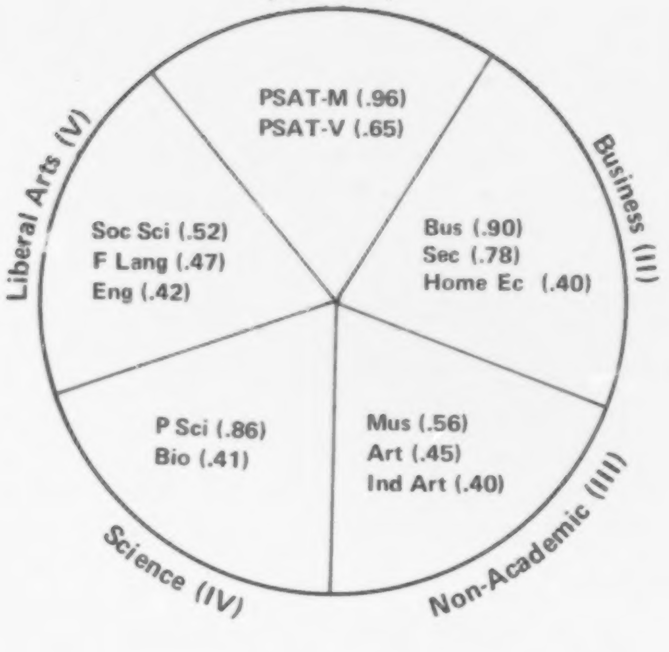
Figure III-3

Summary of UMLFA for PSAT and SI-1 (from Table III-4)

MALES


Ability (I)
PSAT-M (.99)
PSAT-V (.75)
Business (II)
Sec (.63)
Home Ec (.56)
Bus (.49)
Non-Academic (III)
Art (.74)
Mus (.40)
Ind Art (.40)
Science (IV)
P Sci (.60)
Bio (.57)
Soc Sci (.44)
Liberal Arts (V)
F Lang (.54)
Eng (.52)
Mus (.46)

FEMALES


Ability (I)
PSAT-M (.96)
PSAT-V (.65)
Business (II)
Bus (.90)
Sec (.78)
Home Ec (.40)
Non-Academic (III)
Mus (.56)
Art (.45)
Ind Art (.40)
Science (IV)
P Sci (.86)
Bio (.41)
Liberal Arts (V)
Soc Sci (.52)
F Lang (.47)
Eng (.42)

The follow-up of the school-going sample from grade 12 to 13 provided yet another opportunity to investigate structural changes in students' own ratings of interests. It should be noted that this sample of students is quite different from that on which the preceding analyses at grades 11 and 12 are based. The school-going sample, as the name indicates, includes only those students who later continued their education past the secondary school level into grade 13; the five per cent sample on which the grade 11 to 12 analyses are based is an undifferentiated group with regard to post-secondary school education.

Since the grade 13 interest titles being rated differ in a good many cases from those at grade 12, direct comparisons are often difficult. Sufficient overlap exists, however, to warrant at least a brief look at resulting factor structures (which is presented for males only). The interest titles rated at grades 12 and 13 are listed below:

Grade 12	Grade 13
Biology	Biological Sciences
Physical Science	Physical Science
Mathematics	Mathematics
Business	Business
Social Studies	Social Science
Art	Art/Architecture
English	Humanities
Industrial Arts	Engineering
Home Economics	Home Economics/Health/ Physical Education
Foreign Languages	Education
Secretarial	Applied Science
Music	Agriculture

Factor solutions for school-going males only, based on intercorrelations among interest ratings for grade 12 (SI-1) and grade 13 (SI-2), are presented in Tables III-5 and III-6. Note that PSAT-V and PSAT-M are not included. At the head of the column for each of the first four factors is the roman numeral which identified a corresponding factor in previous solutions.

Table III-5

Maximum Likelihood Solution for SI-1 for School-Going Males

(Varimax-Rotated Factor Matrix)

	II	III	IV	V	
Bio	0.016	0.178	0.356	0.162	0.039
Eng	-0.009	0.226	0.014	0.613	0.092
Art	0.122	0.685	-0.012	0.041	0.018
Math	0.097	-0.072	0.345	-0.050	0.115
Soc Sci	0.112	-0.002	0.044	0.444	0.083
Sec	0.616	0.154	0.082	0.121	0.069
P Sci	-0.048	0.092	0.994	0.008	-0.036
F Lang	0.015	0.157	0.170	0.269	0.935
Mus	0.130	0.449	0.096	0.150	0.114
Ind Art	0.364	0.270	0.109	-0.285	-0.032
Home Ec	0.601	0.235	0.091	-0.017	0.023
Bus	0.565	-0.054	-0.057	0.087	-0.024

Table III-6

Maximum Likelihood Solution for SI-2 for School-Going Males

(Varimax-Rotated Factor Matrix)

	II	IV	V		
Biological Science	-0.078	0.441	0.160	0.010	0.347
Physical Science	0.002	0.932	0.002	0.360	0.047
Mathematics	0.091	0.241	-0.103	0.456	-0.001
Social Sciences	0.130	0.060	0.538	-0.242	-0.044
Humanities	0.034	0.044	0.816	-0.158	-0.092
Art/Architecture	0.030	-0.011	0.344	0.146	0.113
Education	0.397	0.025	0.329	-0.167	0.149
Business	0.569	-0.054	0.067	0.158	0.087
Engineering	0.085	0.057	-0.084	0.888	0.178
Home Ec/Health/ Physical Education	0.287	0.055	-0.007	0.077	0.429
Agriculture	0.099	0.057	0.027	0.096	0.725
Applied Science	-0.038	0.232	-0.037	0.446	0.406

Insert Tables III-5 and III-6 about here

Unlike the grade 12 solution for the five per cent random sample of males, *Foreign Language* emerges as a separate factor (last column, Table III-5) when only the group of school-going males is considered. Since the grade 13 list of titles did not include one for foreign language but rather a composite of fields designated as humanities, it was impossible to see whether this factor would emerge at grade 13 also.

The grade 13 solution (Table III-6) includes, in addition to *Science* (IV), *Liberal Arts*, (V), and *Business (and Education)* (II), a factor identified as *Engineering and Applied Science* (col. 4, Table II-6). This factor does not appear to have a grade 12 equivalent (at grade 12, the variable industrial arts, which bears the closest resemblance to applied science, loads heaviest on *Business*), but it does look very much like Factor III in the grade 11 SI analysis (Table III-2). Finally, another factor emerging at grade 13 has a sizeable loading on agriculture, which, of course, has no real counterpart at grade 12.

Considering differences in titles used to rate interests at grades 11, 12 and 13, the stability of the structure of academic interests is quite remarkable. Indeed, there is a correspondence in three of the five interest factors--*Business* (II), *Science* (IV), and *Liberal Arts* (V [illegible] o emerge from the factor solutions at all three grades. Two of the fa [illegible] s emerging are related to interests defined solely at one grade level: *Foreign Language* at grade 12, and *Agriculture* which loads most heavily on Art at grade 12, does not emerge as a separate factor at grade 13, though there appears to be sufficient overlap in the titles being rated to allow a corresponding factor to be identified at grade 13. (Art/Architecture at grade 13 includes art and music along with several other fields.)

The Domain of Values

The relative independence of academic interests and abilities having already been demonstrated, the relationship of values to both these sets of variables has yet to be explored. The literature on this topic contains considerable disagreement. Thorndike, Weiss, and Dawis (1968) have recently suggested that the typically low correlations reported between interest and need (or value) measures may be due to inadequate statistical techniques. Using canonical correlations between Strong Vocational Interest Blank and Minnesota Importance Questionnaire scales, they concluded that interests and needs belong to the same domain. Katz (1969) points out that similarities between items in the two instruments may account for the significant canonical correlations. Since the SVIB mingles "interest" and "value" items, it should not be identified in this context as a "pure" measure of vocational interests. He suggests that distinctions between interests and values have importance for career guidance and should be maintained.

Data from the present study afforded the opportunity to investigate the relative independence of these variables and their factorial makeup for several different study groups. This was possible because the questionnaires sent to the school-going and nonschool-going groups one year after completion of high school contained identical items which required rating the importance of 12 occupational values. In addition to the division into school-going and nonschool-going groups, a further separation was possible for members of the school-going group into those attending four-year and two-year institutions.

As in previous analyses, intercorrelations among the variables (12 AIM scores, PSAT-V, PSAT-M, and 12 values) for each of six groups (students attending four-year colleges, students attending two-year schools, and nonschool-going, separately by sex) were subjected to an unrestricted maximum likelihood factor analysis. Factor solutions appear in Tables III-7 to III-12.

Tables III-7 to III-12 about here

What is most striking is the general similarity of structure across these six tables. Abilities, interests, and values seem to form independent domains. Factors in one domain tend to have essentially zero or negligible loadings on variables in other domains. "Cross-overs" from one domain to another are rare, with the few instances concentrated in the group of nonschool-going males.

The structure for all six groups seems to lend itself to virtually identical interpretations of Factors I through VI: I is clearly Ability, and Factors II through VI are readily identified as interests: Business, Nonacademic (or possibly Art), Science, Liberal Arts, and Mathematics, respectively.

The abilities factor and four of the five interest factors, Business (II), Nonacademic (III), Science (IV), and Liberal Arts (V), correspond to factors emerging in previous solutions. It will be recalled that the factor identified as Mathematics Interest (VI), was evidenced in the grade 11 solution for females only and replaced a Nonacademic Interest factor that emerged for the males. Here we find both Nonacademic Interest and Mathematics Interest identified as separate factors for both males and females in the groups that responded to questionnaires one year after graduation from high school.

Besides the abilities factor and the five interest factors, the 10-factor solutions for the school-going groups and for the nonschool-going females

Table III-7

Maximum Likelihood Solution for PSAT, AIM, and Values

for Males Attending Four-Year Schools

(Varimax-Rotated Factor Matrix)

	I	II	III	IV	V	VI	V-1	V-2	V-3	V-4
PSAT-V	0.839	-0.154	-0.025	-0.005	0.220	-0.084	-0.064	0.014	-0.110	-0.079
PSAT-M	0.842	-0.021	-0.044	0.048	-0.019	0.197	-0.003	-0.031	-0.086	0.031
AIM - Bio	-0.031	0.077	0.044	0.726	0.154	0.046	0.016	0.003	-0.002	0.106
Eng	0.082	0.120	0.152	-0.012	0.853	0.024	-0.062	0.104	-0.012	-0.069
Art	-0.061	0.156	0.636	0.197	0.328	-0.007	0.004	0.060	-0.075	-0.075
Math	0.172	0.192	0.010	0.450	0.137	0.843	0.017	-0.024	0.023	-0.011
Soc Sci	0.049	0.220	-0.149	0.119	0.686	0.005	-0.054	0.085	0.016	-0.071
Sec	-0.122	0.707	0.169	0.118	0.161	0.101	0.008	-0.076	0.062	0.063
P Sci	0.087	0.089	0.015	0.910	0.220	0.142	0.009	-0.014	0.021	-0.087
F Lang	0.089	0.126	0.116	0.153	0.600	0.074	-0.022	0.088	0.032	0.115
Mus	-0.026	0.091	0.330	0.149	0.508	0.005	-0.009	0.026	-0.073	0.067
Ind Art	-0.003	0.288	0.376	0.653	-0.061	0.146	0.015	0.026	-0.017	-0.071
Home Ec	-0.093	0.497	0.332	0.296	0.216	-0.020	0.027	0.009	-0.021	0.174
Bus	-0.020	0.889	-0.097	0.150	0.383	0.063	0.006	0.042	0.093	-0.127
Income	-0.092	0.039	0.019	0.009	-0.086	0.025	0.253	0.004	0.796	-0.097
Prestige	-0.051	0.032	-0.064	-0.033	0.073	-0.006	0.160	0.215	0.554	0.025
Freedom	-0.112	-0.021	0.000	-0.024	0.080	0.039	0.041	0.382	0.066	-0.062
Helping	-0.137	0.059	-0.131	-0.024	0.128	-0.044	0.005	0.526	-0.062	0.301
Security	-0.188	0.058	-0.037	0.071	-0.105	0.016	0.372	0.265	0.381	0.223
Variety	0.199	-0.041	0.026	-0.011	0.049	-0.020	0.143	0.462	0.003	-0.076
Responsibility	-0.051	0.147	-0.112	0.010	0.074	-0.025	-0.019	0.516	0.358	0.165
Interest	0.077	-0.033	-0.036	0.045	-0.009	-0.040	0.116	0.575	0.040	0.062
Leisure	0.066	-0.004	0.007	-0.011	-0.043	0.013	0.599	0.167	0.187	-0.118
Work. Cond.	-0.106	0.016	0.014	0.035	-0.062	-0.005	0.766	0.239	0.231	0.108
Creativity	0.024	-0.028	0.124	0.006	0.018	0.001	0.062	0.382	0.008	-0.168
Pride	-0.046	0.016	0.077	0.008	0.020	0.027	0.093	0.638	0.131	0.080

Table III-8

Maximum Likelihood Solution for PSAT, AIM, and Values

for Females Attending Four-Year Schools

(Varimax-Rotated Factor Matrix)

	I	II	III	IV	V	VI	V-1	V-2	V-3	V-4
PSAT-V	0.849	-0.177	0.001	0.054	0.168	-0.095	-0.173	0.080	-0.051	0.032
PSAT-M	0.806	-0.071	0.069	0.008	-0.021	0.304	-0.103	-0.009	-0.043	0.008
AIM - Bio	0.011	0.111	0.074	0.785	0.184	0.043	-0.057	0.009	0.016	-0.115
Eng	0.028	0.036	0.130	0.003	0.825	0.013	-0.065	0.105	0.055	0.010
Art	0.054	0.098	0.720	0.076	0.414	-0.008	0.012	0.045	0.025	-0.039
Math	0.166	0.174	0.070	0.265	0.111	0.770	-0.035	-0.037	0.002	-0.017
Soc Sci	0.012	0.104	-0.097	0.223	0.672	0.022	-0.084	0.084	0.044	0.186
Sec	-0.129	0.792	0.085	0.025	0.031	0.040	0.125	-0.131	-0.007	-0.118
P Sci	0.039	0.041	0.120	0.859	0.236	0.193	-0.069	0.034	-0.003	0.117
F Lang	0.095	0.132	0.102	0.098	0.674	0.069	-0.039	0.018	0.008	-0.069
Mus	0.009	0.105	0.253	0.186	0.492	0.010	-0.020	0.036	0.016	-0.080
Ind Art	0.044	0.221	0.576	0.441	0.092	0.172	-0.044	-0.010	-0.005	0.106
Home Ec	-0.109	0.533	0.180	0.146	0.325	0.088	0.036	-0.035	-0.000	-0.256
Bus	-0.082	0.863	0.026	0.163	0.323	0.123	0.052	-0.039	0.043	0.310
Income	-0.137	0.063	-0.006	0.002	-0.063	0.001	0.701	-0.080	0.006	0.053
Prestige	-0.011	0.023	0.003	-0.052	0.003	-0.019	0.543	-0.004	0.121	0.062
Freedom	-0.030	-0.081	0.002	0.019	0.088	-0.008	0.122	0.381	0.086	0.079
Helping	-0.139	0.108	-0.179	0.035	0.039	0.038	-0.116	0.404	0.179	-0.210
Security	-0.095	0.106	-0.066	-0.022	-0.025	0.034	0.399	0.125	0.066	-0.236
Variety	0.163	-0.105	0.039	0.003	0.021	-0.038	0.079	0.405	0.037	0.077
Responsibility	-0.055	0.056	-0.061	0.018	0.066	0.019	0.141	0.262	0.945	-0.063
Interest	0.074	0.009	0.035	-0.004	0.029	-0.014	0.031	0.544	0.065	-0.068
Leisure	0.055	-0.063	0.045	-0.032	-0.003	-0.052	0.571	0.196	-0.043	0.040
Work. Cond.	-0.089	0.068	-0.005	-0.019	-0.108	0.009	0.645	0.216	-0.004	-0.083
Creativity	-0.056	-0.082	0.190	-0.009	0.085	-0.043	0.068	0.456	0.476	0.086
Pride	-0.058	-0.002	-0.028	0.003	0.001	0.021	0.110	0.585	0.001	-0.057

Table III-9

Maximum Likelihood Solution for PSAT, AIM, and Values for Males Attending Two-Year Schools

(Varimax-Rotated Factor Matrix)

	I	II	III	IV	V	VI	V-1	V-2	V-3	V-4
PSAT-V	0.822	-0.080	0.010	-0.014	0.150	-0.087	0.166	-0.043	0.005	0.051
PSAT-M	0.755	0.022	-0.026	0.005	-0.015	0.152	-0.085	-0.030	-0.022	-0.028
AIM - Bio	-0.081	0.131	0.113	0.664	0.213	0.109	-0.026	0.036	0.046	-0.112
Eng	0.036	0.128	0.070	0.045	0.881	0.034	-0.088	0.060	0.108	0.048
Art	-0.039	0.201	0.593	0.262	0.426	0.061	-0.018	0.018	-0.029	0.049
Math	0.109	0.242	0.068	0.340	0.206	0.872	0.057	-0.052	0.003	0.005
Soc Sci	0.066	0.256	-0.124	0.197	0.659	0.045	-0.062	0.004	0.131	0.070
Sec	-0.099	0.655	0.168	0.150	0.334	0.147	0.090	0.016	0.003	-0.086
P Sci	0.060	0.163	-0.010	0.933	0.285	0.107	-0.005	0.008	-0.058	0.048
F Lang	0.074	0.169	0.128	0.180	0.623	0.097	0.004	0.138	-0.086	-0.049
Mus	0.003	0.186	0.263	0.202	0.529	0.028	0.070	0.134	-0.065	-0.020
Ind Art	0.108	0.423	0.362	0.568	0.085	0.171	0.111	-0.014	0.005	0.111
Home Ec	-0.044	0.492	0.317	0.305	0.325	0.017	0.021	0.032	-0.054	-0.129
Bus	0.010	0.879	-0.068	0.211	0.399	0.093	0.021	0.011	0.064	0.075
Income	-0.065	0.037	0.046	0.044	-0.074	-0.003	0.635	-0.130	0.168	-0.075
Prestige	-0.076	0.001	-0.119	-0.043	0.084	-0.053	0.460	0.263	0.272	-0.004
Freedom	0.013	0.048	-0.022	-0.012	-0.010	-0.009	0.105	0.579	0.080	0.079
Helping	-0.156	0.040	-0.005	-0.064	0.174	-0.050	-0.052	0.579	0.073	-0.183
Security	-0.120	0.068	-0.042	0.065	-0.140	-0.013	0.465	0.234	0.009	-0.311
Variety	0.189	-0.004	0.031	0.128	-0.017	-0.046	0.107	0.345	-0.008	0.092
Responsibility	-0.020	0.050	-0.023	-0.006	0.127	0.024	0.143	0.588	0.613	-0.045
Interest	0.050	-0.006	-0.005	0.060	0.010	-0.026	0.175	0.475	0.094	-0.167
Leisure	0.012	-0.025	0.038	-0.039	0.037	0.025	0.576	0.234	-0.134	0.160
Work. Cond.	-0.135	0.070	0.030	-0.000	-0.009	0.093	0.685	0.341	-0.103	0.035
Creativity	-0.030	-0.077	0.079	-0.074	0.095	-0.010	0.061	0.711	-0.087	0.404
Pride	-0.105	-0.003	0.014	0.021	0.070	0.070	0.131	0.618	-0.053	-0.063

Table III-10

Maximum Likelihood Solution for PSAT, AIM, and Values

for Females Attending Two-Year Schools

(Varimax-Rotated Factor Matrix)

	I	II	III	IV	V	VI	V-1	V-2	V-3	V-4
PSAT-V	0.958	-0.143	-0.037	0.069	0.171	-0.106	-0.124	0.006	0.018	-0.005
PSAT-M	0.705	0.017	0.075	-0.005	-0.020	0.251	-0.141	-0.015	-0.019	-0.033
AIM-Bio	-0.044	0.156	0.112	0.793	0.286	0.061	-0.031	-0.045	0.147	0.011
Eng	0.015	0.070	0.118	0.012	0.834	0.024	-0.078	0.091	-0.007	-0.020
Art	0.064	0.146	0.659	0.143	0.464	-0.003	-0.039	0.098	0.191	-0.065
Math	0.112	0.197	0.085	0.217	0.167	0.929	-0.046	-0.004	-0.000	-0.039
Soc Sci	-0.003	0.143	-0.122	0.291	0.684	-0.011	0.046	0.064	-0.155	-0.092
Sec	-0.049	0.854	0.067	0.024	0.138	0.080	0.135	-0.072	0.044	0.038
P Sci	0.075	0.080	0.173	0.868	0.236	0.151	-0.040	0.028	-0.114	-0.006
F Lang	0.107	0.192	0.113	0.126	0.663	0.096	-0.040	0.061	0.077	0.092
Mus	0.031	0.177	0.218	0.218	0.572	0.090	-0.117	0.039	0.037	0.070
Ind Art	0.064	0.214	0.659	0.430	0.161	0.145	-0.057	0.025	-0.159	-0.040
Home Ec	-0.121	0.592	0.188	0.216	0.392	0.050	-0.010	-0.025	0.273	0.054
Bus	-0.015	0.819	0.090	0.193	0.331	0.117	0.150	0.009	-0.211	-0.038
Income	-0.135	0.063	-0.048	-0.065	-0.082	0.010	0.658	-0.078	-0.086	-0.063
Prestige	-0.023	0.007	-0.070	0.013	-0.014	-0.037	0.563	0.169	-0.162	0.085
Freedom	-0.054	0.044	0.053	0.017	0.017	-0.005	0.221	0.510	-0.122	-0.025
Helping	-0.079	0.031	-0.100	0.005	0.069	-0.076	-0.059	0.472	-0.009	0.503
Security	-0.108	0.109	0.035	-0.032	-0.040	0.019	0.563	0.168	-0.009	0.333
Variety	0.283	0.015	0.125	-0.069	-0.039	-0.143	0.143	0.341	0.020	-0.092
Responsibility	-0.141	0.068	-0.085	0.044	0.011	0.079	0.186	0.565	-0.131	0.162
Interest	0.073	-0.065	-0.001	0.003	0.078	0.011	-0.009	0.355	0.028	0.080
Leisure	0.060	0.003	0.081	0.046	-0.021	-0.087	0.544	0.217	0.207	-0.151
Work. Cond.	-0.044	0.112	-0.037	-0.053	-0.023	0.026	0.535	0.270	0.216	-0.124
Creativity	-0.047	-0.048	0.106	0.029	0.086	-0.027	0.080	0.754	0.077	-0.241
Pride	0.068	-0.030	0.002	-0.039	0.013	0.001	0.095	0.492	0.089	0.106

Table III-11

Maximum Likelihood Solution for PSAT, AIM, and Values

for Nonschool-Going Males

(Varimax-Rotated Factor Matrix)

	I	II	III	IV	V	VI	V-1	V-2	V-3	V-4
PSAT-V	0.817	-0.180	-0.078	-0.002	0.120	-0.152	0.187	0.028	-0.078	-0.006
PSAT-M	0.894	-0.021	-0.032	-0.041	0.033	0.120	0.027	0.018	-0.039	-0.080
AIM - Bio	-0.075	0.119	0.056	0.644	0.063	0.074	0.102	-0.121	-0.044	0.207
Eng	0.137	0.181	0.173	-0.024	0.799	0.147	0.116	0.232	-0.036	0.027
Art	-0.046	0.113	0.946	0.019	0.184	-0.020	0.035	0.083	-0.070	0.035
Math	0.344	0.283	-0.023	0.218	0.112	0.529	-0.135	-0.128	0.098	0.109
Soc Sci	-0.001	0.363	0.014	0.119	0.564	0.060	0.275	0.145	-0.033	-0.020
Sec	-0.111	0.704	0.122	-0.003	0.116	0.286	-0.065	0.121	0.032	0.174
P Sci	0.069	0.085	0.087	0.932	0.114	0.044	0.062	0.138	0.112	-0.059
F Lang	0.195	0.120	0.030	0.173	0.501	0.113	0.160	0.182	-0.016	0.419
Mus	0.028	0.218	0.118	0.087	0.301	0.037	0.006	0.669	0.025	0.130
Ind Art	-0.046	0.207	0.487	0.390	-0.098	0.098	-0.086	-0.016	0.253	-0.074
Home Ec	-0.128	0.397	0.387	0.182	0.134	0.182	-0.097	0.152	-0.058	0.372
Bus	-0.031	0.902	0.127	0.141	0.275	0.160	0.056	0.055	0.056	0.063
Income	-0.105	0.023	-0.038	0.107	-0.068	0.154	-0.048	-0.101	0.967	0.004
Prestige	-0.094	-0.111	-0.047	0.286	-0.164	-0.018	0.324	-0.100	0.046	0.161
Freedom	-0.056	0.110	0.109	-0.020	0.462	-0.035	0.475	0.234	-0.181	0.289
Helping	0.057	0.077	0.020	0.035	-0.012	0.694	0.206	0.013	0.142	0.049
Security	-0.129	0.323	0.034	0.069	0.153	0.391	0.089	-0.032	-0.116	-0.039
Variety	0.023	-0.029	0.111	-0.103	0.145	0.030	0.207	0.880	-0.142	0.031
Responsibility	-0.140	0.207	0.090	0.116	0.062	0.294	0.146	0.114	0.019	0.432
Interest	-0.136	0.223	-0.056	-0.012	0.156	0.508	0.055	0.266	0.082	0.276
Leisure	0.108	-0.234	0.003	0.279	-0.048	0.210	0.512	0.008	-0.155	-0.089
Work. Cond.	0.165	0.003	0.063	0.044	0.199	0.048	0.567	0.083	-0.046	0.126
Creativity	0.064	0.153	0.019	0.005	0.258	0.228	0.639	0.104	-0.057	-0.096
Pride	-0.040	0.005	0.489	0.015	0.045	-0.057	0.388	0.198	-0.071	0.109

Table III-12

Maximum Likelihood Solution for PSAT, AIM, and Values for Nonschool-Going Females

(Varimax-Rotated Factor Matrix)

	I	II	III	IV	V	VI	V-1	V-2	V-3	V-4
PSAT-V	0.844	-0.156	0.038	0.023	0.216	-0.091	-0.112	0.004	-0.092	-0.060
PSAT-M	0.733	-0.121	0.010	-0.052	0.070	0.321	-0.196	-0.015	0.002	0.049
AIM-Bio	-0.021	0.027	0.111	0.826	0.073	0.040	0.021	0.025	0.005	0.171
Eng	0.055	0.071	0.131	0.020	0.832	0.010	-0.091	0.097	0.061	0.051
Art	0.055	0.062	0.710	0.077	0.315	-0.050	-0.018	0.100	0.095	0.100
Math	0.112	0.143	0.053	0.189	0.151	0.810	-0.061	-0.039	0.013	0.017
Soc Sci	0.031	0.093	-0.106	0.268	0.727	-0.017	-0.130	0.086	0.011	-0.090
Sec	-0.088	0.889	0.074	-0.055	-0.056	0.032	0.126	-0.065	-0.002	0.076
P Sci	-0.023	0.031	0.216	0.805	0.328	0.197	0.062	0.008	0.027	-0.169
F Lang	0.117	0.021	0.184	0.021	0.577	0.123	0.026	0.102	-0.024	0.045
Mus	0.084	0.051	0.322	0.117	0.535	0.076	0.068	0.065	-0.017	0.009
Ind Art	-0.023	0.103	0.635	0.377	0.153	0.139	-0.114	-0.016	-0.052	-0.108
Home Ec	-0.158	0.388	0.096	0.204	0.103	0.066	0.046	0.124	0.073	0.304
Bus	-0.121	0.765	0.027	0.079	0.368	0.113	0.053	-0.096	0.038	-0.165
Income	-0.121	0.034	0.042	0.083	-0.047	-0.043	0.558	-0.027	0.232	-0.019
Prestige	-0.084	0.105	0.015	-0.013	-0.025	0.024	0.167	0.238	0.654	0.011
Freedom	-0.011	-0.007	0.155	-0.015	0.030	-0.030	0.070	0.509	0.242	-0.122
Helping	-0.139	0.041	-0.093	0.150	0.061	0.018	0.003	0.558	0.054	0.105
Security	-0.049	0.132	-0.108	0.032	-0.050	0.011	0.512	0.290	-0.005	0.048
Variety	0.296	-0.001	0.032	-0.095	0.015	-0.031	0.060	0.405	0.044	-0.196
Responsibility	-0.118	0.026	-0.046	0.040	0.139	0.059	0.002	0.471	0.371	0.063
Interest	0.093	-0.079	0.008	-0.010	0.032	-0.016	0.130	0.549	0.083	0.045
Leisure	0.092	-0.094	0.044	0.023	0.016	-0.035	0.255	0.134	0.285	-0.009
Work. Cond.	-0.138	0.099	-0.056	-0.105	-0.021	-0.032	0.583	0.324	0.028	-0.013
Creativity	0.003	-0.046	0.165	-0.066	0.125	-0.050	0.091	0.677	0.075	-0.072
Pride	0.038	-0.005	-0.037	0.035	0.051	0.018	0.177	0.674	-0.038	0.092

include four values factors. While the independence of abilities from interests and values stands up for the nonschool-going males, the independence of interests from values is not quite so clean-cut as in the school-going groups and the nonschool-going females. Occasionally, an interest or a value factor for nonschool-going males has a sizeable loading on a variable from the other domain (Table III-11). Thus, while all five of the interest factors identified for the school-going groups and nonschool-going females are also identifiable in solutions for nonschool-going males, the virtually complete independence of interests from values evidenced for school-going groups and for nonschool-going females is somewhat blurred for nonschool-going males.

Given these differences between groups, the density and multiplicity of tables make a clear conceptualization of the values factors somewhat difficult to derive from Tables III-7 to III-12. In order to present a less cluttered picture of the values domain, separate factor analyses of values were run for the school-going males and females and the nonschool-going males and females. For school-going males (Table III-13) the four values factors that emerge may be defined as follows: V-1, *Concomitant Returns*, with highest loadings on "Pleasant working conditions," "Security, steady work," and "Leisure time"; V-2, *Intrinsic Satisfactions*, with highest loadings on "Sense of accomplishment, pride in work," "Interest in the work activities," "Creativity, expression of ideas," and "Freedom to make decisions"; V-3, *Status* or *Level*, with highest loadings on "Prestige, looked up to by others," "Leadership, responsibility for others," and "Money, income"; and V-4, *Altruism*, "Helping others." For school-going females (Table III-14), the picture is quite different with only one of the value factors, *Intrinsic Satisfactions* (V-2), closely parallel to V-2 for the school-going males. Another factor, V-1, seems to be a combination of value factors that may be called *Extrinsic Rewards*. Factors V-3 and V-4 are not clearly defined; V-3 includes a sizeable loading on an *Intrinsic* variable, "Sense of accomplishment, pride in work," along with its very high loading on the *Concomitant* variable, "Pleasant working conditions," and the melange of values on which V-4 loads substantially seems difficult to interpret. Other factor solutions did not provide clearer results. For this group as well as for the other groups, three factor solutions were less readily interpretable than the four factor solutions. Five factor solutions, on the other hand, had chi-square probabilities that were rather large.

Factors V-2 and V-3 (*Intrinsic Satisfactions* and *Status* or *Level*) identified for school-going males also appear in the solution for the nonschool-going males. Factor V-1 seems somewhat similar for both male groups, although for the nonschool-goers V-1 includes a sizeable loading on "Money, income" and does not load substantially on "Leisure time" and thus might also more appropriately be called *Extrinsic Rewards*. Perhaps this discrepancy implies a difference in the way school-going and nonschool-going males regard the value "Money, income." For nonschool-going males, income seems to go with a factor that includes "Pleasant working conditions" and "Security, steady work." School-going males, on the other hand, seem to identify income with prestige and leadership as a symbol of status. V-4 for the nonschool-going males may be said to represent a "hippie" orientation--leisure, freedom, and variety. In the solution for the nonschool-going females (Table III-16), V-1 and V-2 load on virtually the same variables as V-1 and V-2 for the nonschool-going males, and V-3 loadings for the females resemble V-3 loadings for the males. Factor V-4 for the females, however, does not appear to be quite compatible with any of the other interpretations.

Insert Tables III-13 to III-16 about here

Table III-13

Maximum Likelihood Solution for Values for School-Going Males

(Varimax-Rotated Factor Matrix)

	V-1	V-2	V-3	V-4
Income	0.190	-0.030	0.494	-0.174
Prestige	0.141	-0.042	0.734	0.102
Freedom	0.041	0.545	0.287	0.232
Helping	0.082	0.205	0.054	0.974
Security	0.637	0.071	0.068	0.179
Variety	0.166	0.316	0.056	-0.050
Responsibility	-0.107	0.330	0.574	0.299
Interest	0.165	0.571	-0.119	0.025
Leisure	0.533	0.184	0.089	-0.099
Work. Cond.	0.858	0.194	0.123	0.006
Creativity	0.010	0.547	0.105	0.086
Pride	0.197	0.679	-0.123	0.166

Table III-14

Maximum Likelihood Solution for Values for School-Going Females

(Varimax-Rotated Factor Matrix)

	V-1	V-2	V-3	V-4
Income	0.834	-0.048	0.048	0.131
Prestige	0.588	0.112	0.078	-0.101
Freedom	0.136	0.690	-0.048	0.040
Helping	-0.215	0.059	0.104	0.597
Security	0.392	0.052	0.076	0.607
Variety	-0.028	0.357	0.002	0.205
Responsibility	-0.004	0.277	-0.120	0.615
Interest	0.158	0.255	0.002	0.258
Leisure	0.622	0.096	0.237	0.022
Work. Cond.	0.507	0.048	0.861	0.020
Creativity	0.018	0.888	0.164	0.105
Pride	0.066	0.520	0.419	0.491

Table III-15

Maximum Likelihood Solution for Values for Nonschool-Going Males

(Varimax-Rotated Factor Matrix)

	V-1	V-2	V-3	V-4
Income	0.529	-0.272	0.270	-0.025
Prestige	0.231	0.071	0.748	0.101
Freedom	0.020	0.470	0.305	0.483
Helping	0.278	0.327	0.314	0.259
Security	0.437	0.048	0.198	-0.064
Variety	-0.141	0.141	0.021	0.355
Responsibility	0.126	0.229	0.608	0.166
Interest	-0.038	0.575	0.082	0.239
Leisure	0.184	0.058	0.148	0.569
Work. Cond.	0.610	0.421	-0.062	0.302
Creativity	0.074	0.767	0.135	0.240
Pride	0.030	0.861	0.143	-0.014

Table III-16

Maximum Likelihood Solution for Values for Nonschool-Going Females

(Varimax-Rotated Factor Matrix)

	V-1	V-2	V-3	V-4
Income	0.416	-0.086	0.036	0.412
Prestige	0.074	0.096	0.403	0.514
Freedom	0.028	0.467	0.213	0.275
Helping	0.165	0.405	0.398	-0.062
Security	0.673	0.142	0.154	0.069
Variety	0.053	0.388	0.080	0.058
Responsibility	0.054	0.276	0.645	0.178
Interest	0.177	0.459	0.274	0.042
Leisure	0.111	0.141	0.013	0.395
Work Cond.	0.527	0.280	-0.027	0.311
Creativity	0.007	0.794	0.059	0.236
Pride	0.298	0.587	0.230	-0.035

On the basis of the present analyses of 12 occupational values, it seems likely that the values domain includes what may be broadly defined as Extrinsic and Intrinsic factors. Further, it is conjectured that females fail to make as sharp a distinction between extrinsic and intrinsic kinds of satisfactions as do males, particularly school-going males. Other sex differences are apparent, and variations in factor solutions across the groups studied tend to discourage a parsimonious conceptualization of the domain.

In summary, then, the structure of academic interests seems to hold remarkably firm and consistent across different groups, across different methods, and across different times.

The structure of occupational values rated one year after graduation from high school seems quite convincingly independent of interests but does not appear to hold so consistent across different groups. This study has not, of course, applied the test of time or of different methods of measurement.

Nevertheless, the independence of the values domain from abilities and interests and its importance in career decision-making seem to warrant continuing efforts to define dimensions in this domain more sharply. It is likely that value constructs are less familiar to students than are constructs of academic interests. Thus, while students' own ratings of interest in each field serve as a sufficient stand-in for 12 AIM items representing that field, perhaps the values domain requires greater specificity of items. Such specific items would induce students to explore and examine values constructs in the very course of measurement.

As students get a chance to participate in guidance programs that incorporate appropriate attention to values in career decision-making, perhaps so elaborate a procedure will no longer be necessary. Then global ratings may become a sufficient substitute, as self-rated interests proved to be for AIM. At present, however, the values domain seems less clearly conceptualized by students, and perhaps by counseling psychologists, than the interest domain. More specific arrays of items to define each value construct seem a necessary step toward clarification for both parties.

IV: THE NONSCHOOL-GOING GROUP

Many of the analyses reported in previous chapters deal with students who continued their schooling into grade 13. This focus is in keeping with the academic nature of the predictors. It seemed of interest, however, to follow up those members of the sample who did not continue with their formal education and to note relationships between AIM and short-term occupational criteria.

At the end of grade 12, students were requested to complete a questionnaire which included an item about educational plans after graduation. Those students who indicated that they definitely did not plan to continue their education during the following year were tentatively identified as nonschool-bound. During the summer following graduation, postcards were mailed to the homes of all the graduates requesting confirmation of educational plans for the forthcoming academic year. Students who were still not planning to attend school were then classified as nonschool-going.

Another major route for identifying nonschool-going students was through reclassification from the school-going sample. Students who had indicated at the end of grade 12 that they planned to continue their education but failed to enroll in any kind of post-secondary school during the year following graduation were included in the nonschool-going sample.

On the other hand, the sample was reduced by reclassifying a small number of graduates who had originally been included in the nonschool-going sample but later indicated on the follow-up questionnaire that they were attending school.

All told, 3996 graduates were classified as nonschool-going. As indicated in Figure 2 (page 12), this number is 32 per cent of the grade 12 sample (as of the summer of 1968). Of these 3996 graduates, 1982 completed and returned usable questionnaire forms during the spring and summer of 1969. Whereas the original sample consisted of approximately equal numbers of males and females, only 32 per cent of these 1982 respondents were males. The underrepresentation of males in this sample was mainly due to the compulsory draft in effect during the course of this research. Many parents returned questionnaires unanswered, stating that their sons were in military service.

Approximately one year after high school graduation the nonschool-going sample received a follow-up questionnaire which included items about educational plans and financial support, occupational field interests, satisfactions and values, and educational goals ("Tell It Like It Is," Appendix A).

Educational Plans

It is interesting to note that approximately half the females and 60 per cent of the males indicate that they are more or less definitely planning to return to school some time during the second year after high school graduation. Furthermore, almost two-thirds of these plan to attend two-year or four-year colleges (Table IV-1).

Insert Table IV-1 about here

Unlike the school-going sample, whose major source of financial support while attending school is "Parents, wife or husband, other relatives," the major expected means of financial support for education for future enrollees from the nonschool-going sample is "Working while attending school." (Table IV-2 shows percentages for males and females combined.)

Table IV-1

Plans for Further Education

	Per Cent	
	M	F
4. Do you plan to return to school during the period June 1969-June 1970?		
(A) Yes, I definitely will	37	24
(B) Maybe I will but I am not sure	23	24
(C) No, I don't think I will	40	52
5. Which of the following best describes the type of school you are likely to attend?		
(A) Four-year (or more) college, university or institute	39	33
(B) Two-year junior or community college	28	24
(C) Technical institute (less than 4-year)	14	3
(D) School of professional nursing (less than 4-year)	0	6
(E) Business or secretarial school (less than 4-year)	4	15
(F) Trade or vocational school or school of practical nursing	9	9
(G) Post-graduate (13th year) high school	0	1
(H) Other (Specify on your answer sheet)	6	8

Table IV-2

Expected Sources of Financial Support

		Per Cent	
	None	Minor	Major
6-15. List sources of financial support while attending school. If you do return to school, indicate how much financial support you are likely to receive from the source named.			
6. Parents, wife or husband, other relatives	30	32	38
7. Working while attending school	25	33	43
8. Personal savings	35	39	26
9. Scholarships or grants from school attended	88	7	5
10. Scholarships or grants from other sources	84	9	7
11. Loans from the National Defense Education Act Loan Fund	87	7	6
12. Loans from college loan funds	90	6	4
13. Loans from banks or other organizations	86	9	5
14. GI Bill, ROTC, or other government assistance	88	4	8
15. Trust fund, insurance plan	94	4	2

Insert Table IV-2 about here

Employment

An indication of the kinds of employment available to high school graduates is provided by responses to items 16 and 17. Information obtained from item 16 was used to classify jobs according to DOT codes. The DOT two-digit codes which included at least 5 per cent of the sample are given in Table IV-3.

Insert Table IV-3 about here

Few job classifications are represented by the sample, and these classifications generally agree with the picture emerging from item 17 (Table IV-4): recent male graduates hold low-level jobs primarily as unskilled workers, repairmen (machine shop, electrical or mechanical), construction workers, or sales persons, while the females are mainly employed as secretaries and clerks.

Insert Table IV-4 about here

AIM scale means for each of the occupational groups (determined from item 17) containing 50 or more members are presented in Table IV-5. Notice that many of the AIM scales exhibit little variation across occupational groups--a not uncommon finding for any academic variable with regard to the job fields listed.

Insert Table IV-5 about here

Table IV-3

DOT Classifications for Occupations of Nonschool-Goers

DOT Code	Description	Per Cent	
		M	F
86	Construction occupations, n.e.c.	6	--
29	Merchandising occupations, except salesmen	--	5
22	Material & production recording occupations	8	--
21	Computing and accounting recording occupations	--	15
20	Stenography, typing, filing & related occupations	--	35

Table IV-4

Individuals' Classifications of Job Fields

	Per Cent	
	M	F
17. In which of the following does your job best fit?		
(A) Medical or laboratory	2.4	6.2
(B) Secretarial, clerical	1.8	39.5
(C) Construction worker	9.7	0.0
(D) Food preparation	5.9	5.4
(E) Farm worker, gardener, logger	5.5	.6
(F) Business machine operator	1.4	4.2
(G) Small machine equipment operator	5.1	1.7
(H) Information giving or receiving	2.2	2.9
(I) Musical, artistic, or entertainment	1.6	.8
(J) Machine shop, electrical, or mechanical repair	14.4	.4
(K) Bookkeeping, cashiering, accounting	3.9	10.6
(L) Purchasing, sales, demonstration, checking stock	9.1	6.5
(M) Fireman, policeman, other protective worker	1.0	.1
(N) Factory worker, warehouseman, unskilled worker	16.8	5.1
(O) Dressmaker, tailor, leather worker	0.0	.5
(P) None of these	19.1	15.5

Table IV-5

AIM Scale Means for Occupational Groups (Item 17)

	MALES				FEMALES					
	Construction Worker	Machine Shop, electrical, etc.	Purchasing, sales, etc.	Factory Worker, warehouseman, etc.	Medical, laboratory	Secretarial, clerical	Food Preparation	Bookkeeping, cashiering, etc.	Purchasing, sales, etc.	Factory Worker, warehouseman, etc.
AIM Scale										
Bio	17.7	14.7	16.4	18.0	18.1	14.0	15.9	13.8	15.0	17.0
Eng	12.7	10.6	13.4	12.9	16.0	17.4	15.6	17.3	19.1	16.7
Art	14.8	14.5	13.7	15.8	19.9	19.0	18.0	19.7	20.4	18.6
Math	17.3	17.7	14.5	16.8	12.8	11.9	12.7	12.7	13.3	12.5
Soc Sci	14.2	13.2	17.6	15.2	15.9	15.6	13.7	15.3	16.9	14.2
Sec	15.2	14.0	15.9	16.9	22.5	26.6	23.2	24.8	21.2	24.8
P Sci	18.7	19.4	18.9	19.3	12.6	10.0	9.7	9.4	11.6	11.7
F Lang	14.0	11.3	13.9	13.5	20.4	18.9	18.7	19.2	22.8	19.0
Mus	12.9	10.7	14.3	13.9	15.5	15.1	14.9	15.6	16.7	14.9
Ind Art	23.8	24.8	20.0	23.5	13.1	10.6	10.8	11.6	11.7	10.9
Home Ec	12.3	12.2	13.0	13.6	26.1	26.0	25.5	26.2	25.0	26.7
Bus	17.1	14.4	17.8	17.1	17.8	21.8	17.1	20.0	18.4	20.0

Occupational Interests

From responses to items 18-29 (Table IV-6), it appears that the job cluster engineer, electrician, etc. is considered the most interesting by males and the clusters of secretary, typist, etc. and artist, designer, etc., the most interesting by females; the females also tend to regard as interesting the job cluster translator, etc. The seeming agreement between these preferences and the most frequent item 17 responses suggests a relationship between interest in job activities and job field entered even at this occupational level and in spite of the large number of factors limiting job choice. The agreement between occupations entered and expressed occupational interests may also reflect what Festinger (1957) has called "reduction of cognitive dissonance."

Finally, it may be noted that females seem to find more of these occupational clusters "interesting" than males do. The means for females are above 2.5 on all the items except 18, and generally tend to be higher than the means for males.

Insert Table IV-6 about here

Occupational Plans

When queried about preferred and expected occupational field 10 years hence (items 30 and 31) the most popular response for males was the job cluster engineer, electrician, etc.; for females the most popular response was the job cluster secretary, typist, etc. Again one is struck by the strong agreement between preferences and expectations, as well as the agreement between present and future.

Insert Table IV-7 about here

Table IV-6

Ratings of Occupational Interests

Consider each group as a whole and not any particular job within the group. Rate each group according to how interesting you think you would find the typical work activities in those occupations. Disregard all other aspects of the job.

Mark your answers as follows:

(4) Very interesting
(3) Somewhat interesting
(2) Kind of dull
(1) Most boring
(0) Cannot say

	Means	
	M	F
18. Engineer, electrician, technician, appliance repairman, mechanic, carpenter	3.3	2.2
19. Biologist, botanist, forest ranger, landscaper, farmer, nurseryman, biology lab aid	2.9	2.8
20. Script writer, reporter, technical writer, copywriter, editorial assistant, letter writer	2.1	2.8
21. Mathematician, financial analyst, accountant, surveyor, computer programmer, bank teller	2.6	2.7
22. Buyer, real estate salesman, office manager, hotel manager, salesman, office clerk	2.5	2.7
23. Musician, singer, composer, music teacher	2.4	2.8
24. Home economist, dietician, chef, nutritionist, tailor, food server	1.7	2.6
25. Secretary, typist, administrative assistant, receptionist, file clerk	1.7	3.2
26. Physicist, chemist, geologist, astronomer	2.7	2.7
27. Translator, foreign language teacher, work in a foreign country	2.5	3.1
28. Sociologist, historian, news analyst, legal investigator	2.5	2.6
29. Artist, designer, potter, cartoonist, photographer	2.9	3.2

Table IV-7

Occupational Plans

	Item 30 Per Cent		Item 31 Per Cent	
	M	F	M	F
30. In which of the groups listed above (18-29) would you like to be working 10 years from now? Record the number of the group on your answer sheet.				
31. In which of these groups do you expect to be working 10 years from now?				
18. Engineer, electrician, technician,appliance repairman, mechanic, carpenter	36	1	44	1
19. Biologist, botanist, forest ranger, landscaper, farmer, nurseryman, biology lab aid	13	7	10	4
20. Script writer, reporter, technical writer, copywriter, editorial assistant, letter writer	3	6	3	2
21. Mathematician, financial analyst, accountant, surveyor, computer programmer, bank teller	13	10	12	10
22. Buyer, real estate salesman, office manager, hotel manager, salesman, office clerk	8	4	10	4
23. Musician, singer, composer, music teacher	7	6	4	1
24. Home economist, dietician, chef, nutritionist, tailor, food server	0	7	1	8
25. Secretary, typist, administrative assistant, receptionist, file clerk	1	30	2	55
26. Physicist, chemist, geologist, astronomer	6	2	3	2
27. Translator, foreign language teacher, work in a foreign country	1	6	1	2
28. Sociologist, historian, news analyst, legal investigator	5	6	4	4
29. Artist, designer, potter, cartoonist, photographer	8	14	6	6

Job Satisfaction

Considering the apparent consistency of the responses with regard to occupational interests, preferences, expectations, and, particularly for the females, occupations entered, it is not surprising to find, as indicated by responses to items 32-40, that these respondents are generally somewhat satisfied with most aspects of their work (Table IV-8). "Opportunities to be creative" appears to be the least satisfying aspect of their work, while "relationships with other workers" seems to be the most satisfying. Again, females tend to express slightly--but consistently--greater satisfaction than males.

Insert Table IV-8 about here

Occupational and Educational Values

Mean ratings of occupational values (items 41-52) are given in Table IV-9. These ratings are quite similar to those obtained from the school-going sample, with "sense of accomplishment," "security," and "interest in the work activities" among the top ranked values and "leisure time," "prestige," and "leadership, responsibility for others," among the lowest ranked values. In general, both the school and nonschool groups tend to consider all the occupational values listed quite important.

Insert Table IV-9 about here

The last set of items on the follow-up questionnaire (items 53-59), requested ratings of educational goals. It appears from responses to these items (Table IV-10) that, while all of the educational goals are considered

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Insert Table IV-10 about here

Table IV-8

Satisfaction with Job

	Means	
	M	F
Indicate how satisfied you are with each aspect of your present job. If you are not working now but have worked since graduating from high school, answer with respect to that job. If you have not worked since graduating from high school, skip this set of questions and go on to question 41.		
Mark your answers as follows: (4) Very satisfied (3) Somewhat satisfied (2) Somewhat dissatisfied (1) Very dissatisfied (0) Cannot say		
32. Working conditions	3.2	3.4
33. Salary	2.7	2.9
34. Job security	3.1	3.3
35. Opportunities for advancement	2.6	2.7
36. Relationships with other workers	3.6	3.7
37. Typical job activities	3.0	3.2
38. Opportunities for learning new skills	2.7	3.0
39. Amount of supervision	3.2	3.4
40. Opportunities to be creative	2.4	2.6

Table IV-9

Occupational Values

	Means	
	M	F
On your answer sheet, write a number from 0 to 10 to show how important each value is to you.		
0 1 2 3 4 5 6 7 8 9 10 Low High		
For example, if money is a quite important value in your choice of an occupation, you might assign it a scale rating of 8. The number 8 would then be written in the box next to question 41.		
41. Money, income	7.8	7.6
42. Prestige, looked up to by others	6.7	6.2
43. Freedom to make decisions	7.9	7.3
44. Helping others	7.6	8.2
45. Security, steady work	8.5	8.6
46. Variety, nonroutine	7.2	7.2
47. Leadership, responsibility for others	6.9	6.4
48. Interest in the work activities	8.5	8.5
49. Leisure time	6.5	5.5
50. Pleasant working conditions	8.0	8.4
51. Creativity, expression of ideas	7.3	7.2
52. Sense of accomplishment, pride in work	8.9	8.9

Table IV-10

Educational Goals

	Means	
	M	F
Rate the importance of each using the scale 0-10 as in questions 41-52 above.		
53. To achieve a broader cultural background	6.9	7.4
54. To develop the ability for critical thinking	7.5	7.3
55. To develop leadership skills	7.5	7.3
56. To prepare for an occupation	8.5	8.6
57. To develop the ability to get along with people	8.0	8.5
58. To increase understanding of community and world problems	7.6	8.0
59. To accept social roles and responsibilities	7.5	8.2

important, preparing for an occupation is rated highest by both sexes. (In general, these ratings do not seem to differ in any noteworthy way from similar ratings by the school-going sample.)

High School Interests and Occupational Interests

No attempt was made to determine the validity with which occupational field actually entered by nonschool-going respondents could be predicted, since neither PSAT nor AIM could be expected to predict well among the limited range of occupations entered by this group. Though it was anticipated that AIM would evidence modest validity for preferred occupational field (item 30), there seemed no useful purpose in making such predictions. It is not readily clear that the prediction of preferred occupational field one year after graduation would prove of value to an 11th- or 12th-grade student, particularly when it is likely that entry into the field would require additional training.

The prediction of expressed occupational interests from PSAT and AIM, however, seems worth examining as a counterpart to the prediction of academic interests in grade 13. As indicated in Tables IV-11 and IV-12, we almost always find the highest correlation between an occupational interest and a correspondingly titled AIM scale. In addition, the pattern of relationships suggests that AIM has differentiating capabilities with regard to expressed occupational interests.

Insert Tables IV-11 and IV-12 about here

This observation is corroborated by differences in interest profiles for the occupational interest groups, as shown in Figures IV-1a and 1b. It was

Table IV-11

Correlations between Occupational Interests (Items 18-29)

and Grade 11 PSAT and AIM

	MALES											
	Engineer, electrician, etc.	**Biologist**, botanist, etc.	**Script writer**, reporter, etc.	**Mathematician**, financial analyst, etc.	**Buyer**, salesman, etc.	**Musician**, singer, etc.	**Home Economist**, dietician, etc.	**Secretary**, typist, etc.	**Physicist**, chemist, etc.	**Translator**, teacher, etc.	**Sociologist**, historian, etc.	**Artist**, designer, etc.
PSAT-V	-.25	.00	.15	-.06	-.20	.14	-.11	-.11	.23	.32	.21	.03
PSAT-M	-.09	-.11	-.03	.14	-.10	.03	-.10	-.06	.07	.15	.05	-.07
AIM Bio	-.19	.35	.11	.13	.10	-.12	.28	.10	.21	.13	.18	.06
Eng	.04	-.05	.55	.08	.22	.39	.24	.26	.06	.34	.44	.26
Art	-.26	-.02	.33	.08	.11	.27	.25	.12	.09	.20	.23	.53
Math	-.15	-.13	.05	.40	.20	-.04	.21	.20	.10	.08	.15	-.07
Soc Sci	.17	.04	.42	.14	.19	.27	.26	.19	.09	.36	.48	.18
Sec	-.11	-.13	.24	.22	.31	.13	.27	.32	-.06	.06	.22	.08
P Sci	-.03	.20	.14	.17	.13	.15	.21	.11	.44	.22	.23	.15
F Lang	.12	.07	.51	.23	.19	.34	.32	.30	.14	.43	.36	.20
Mus	-.19	-.04	.37	.14	.13	.66	.26	.33	.02	.22	.31	.33
Ind Art	.31	.04	.01	.22	.13	-.05	.10	.01	.15	.00	.06	.15
Home Ec	-.08	.05	.23	.09	.21	.24	.34	.31	.03	.17	.23	.24
Bus	.02	-.05	.30	.20	.38	.10	.32	.33	-.03	.21	.37	.15

Table IV-12

Correlations between Occupational Interests (Items 18-29)

and Grade 11 PSAT and AIM

	FEMALES											
	Engineer, electrician, etc.	Biologist, botanist, etc.	Script writer, reporter, etc.	Mathematician, financial analyst, etc.	Buyer, salesman, etc.	Musician, singer, etc.	Home Economist, dietician, etc.	Secretary, typist, etc.	Physicist, chemist, etc.	Translator, teacher, etc.	Sociologist, historian, etc.	Artist, designer, etc.
PSAT-V	.01	.08	.06	-.12	-.09	.05	-.12	-.27	.06	.15	.19	.08
PSAT-M	.02	.05	-.01	.08	-.09	-.01	-.07	-.27	.05	.08	.03	.01
AIM - Bio	.16	.38	-.05	.07	-.01	.02	.15	-.02	.26	.03	.00	-.02
Eng	.10	.09	.36	.01	.04	.18	.00	-.02	.19	.25	.30	.19
Art	.13	.13	.11	.03	.00	.12	-.01	-.02	.18	.18	.17	.50
Math	.18	.03	.01	.40	.10	.04	.00	.02	.11	-.01	-.06	-.08
Soc Sci	.12	.03	.29	.02	.06	.12	-.02	-.03	.18	.20	.35	.05
Sec	.08	-.04	.10	.26	.30	-.03	.02	.45	-.02	-.07	-.07	-.07
P Sci	.24	.25	-.05	.10	-.03	.04	.07	.01	.29	.09	.06	.08
F Lang	.08	.06	.20	.07	.00	.22	-.09	-.03	.18	.36	.24	.17
Mus	.07	.04	.18	.03	.02	.42	.07	.03	.08	.15	.12	.18
Ind Art	.24	.12	-.02	.11	-.09	.04	-.05	-.03	.10	.07	.03	.26
Home Ec	.09	.11	.07	.15	.18	-.02	.21	.14	.09	.00	-.01	.04
Bus	.14	-.02	.21	.26	.32	.03	-.02	.34	.07	.10	.13	-.02

noted that no such differentiation of profiles was found in job fields actually entered. But when the restraints associated with actual job entry are set aside, expressed interests in occupational fields show distinctive differences in AIM profiles. AIM scale means for each group containing 50 or more members are presented in Table IV-13. Several examples of interest profiles are presented in Figure IV-1.

Insert Table IV-13 and Figures IV-1a and 1b about here

Because AIM measures academic interests, the scales would be expected to correlate more highly with later academic interests than with occupational interests. This, however, is not the case. Correlations between occupational interests and corresponding AIM scales, for males, range from .31 (Engineer, electrician, etc. with AIM Industrial Arts) to .66 (Musician, singer, etc. with AIM Music); for females, from .21 (Home economist, dietitian, etc. with AIM Home Economics) to .50 (Artist, designer, etc. with AIM Art). Correlations between corresponding grade 13 interests (SI-2) and the same AIM scales are .30 and .40 for the males and .27 and .35 for the females, respectively (Table II-6).

Correlations between occupational interests and 12th-grade self-ratings of academic interests are given in Tables IV-14 and IV-15. Comparisons between these tables and Tables IV-11 and IV-12 suggest, once again, that students' self-rated interests tend to "behave" in much the same way as inventoried interests.

Insert Tables IV-14 and IV-15 about here

Table IV-13

AIM Scale Means for Occupational

Interest Groups (Item 30)

	MALES			FEMALES								
AIM Scale	Engineer, electrician, etc.	Biologist, botanist, etc.	Mathematician, financial analyst, etc.	Biologist, botanist, etc.	Script Writer, reporter, etc.	Mathematician, financial analyst, etc.	Musician, singer, etc.	Home Econ., dietician, etc.	Secretary, typist, etc.	Translator, teacher, etc.	Sociologist, historian, etc.	Artist, designer, etc.
Bio	17.0	21.5	17.1	21.1	11.4	14.2	15.6	16.6	14.5	14.3	14.0	15.0
Eng	10.7	10.0	13.3	15.0	21.7	14.5	18.3	17.8	15.9	20.0	21.9	17.8
Art	13.8	11.8	14.9	17.2	19.0	18.3	20.0	17.6	18.1	20.8	18.7	24.5
Math	16.8	13.9	22.2	12.5	11.7	17.1	11.0	12.5	12.5	10.4	12.3	11.8
Soc Sci	14.0	13.7	17.0	15.1	19.0	13.1	15.5	16.0	14.5	18.1	20.3	14.1
Sec	15.5	13.9	19.6	20.1	21.1	26.6	22.0	24.0	27.7	23.3	21.0	23.4
P Sci	19.7	18.8	19.8	15.4	9.3	9.5	10.6	10.6	9.9	10.7	10.3	10.9
F Lang	13.3	10.7	15.7	17.8	21.4	17.4	22.7	18.8	18.5	25.6	22.4	19.8
Mus	11.1	10.1	13.4	15.3	15.3	14.9	21.5	15.4	14.4	15.6	15.5	16.2
Ind Art	24.7	21.8	23.3	12.0	9.5	11.5	11.3	10.6	9.9	11.9	10.2	14.0
Home Ec	13.2	12.1	14.0	24.2	24.0	26.3	24.3	28.3	26.9	25.0	23.8	25.9
Bus	16.6	14.5	20.3	15.8	18.0	20.7	17.7	19.3	22.0	20.1	19.1	18.2

Figure IV-1A

AIM Profiles for Occupational Interest Groups (Males)

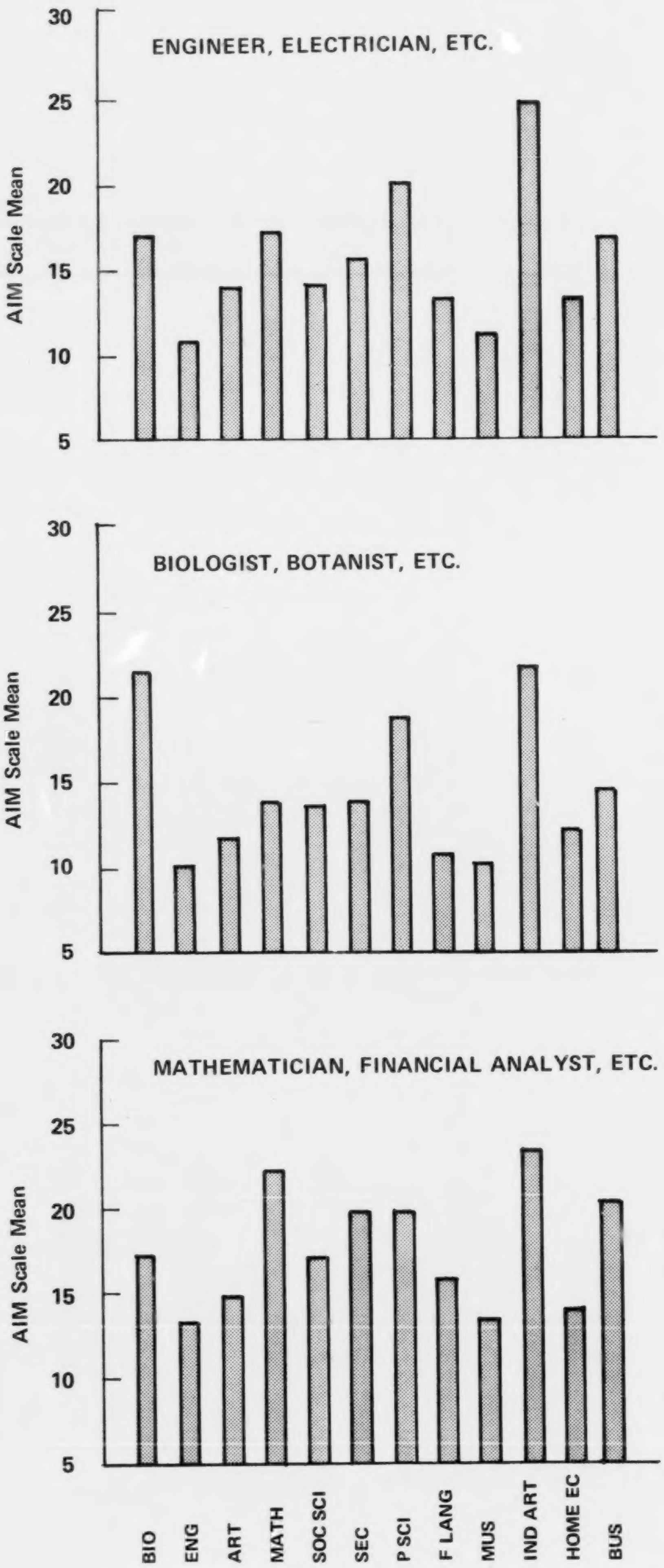

Figure IV-1B

AIM Profiles for Occupational Interest Groups (Females)

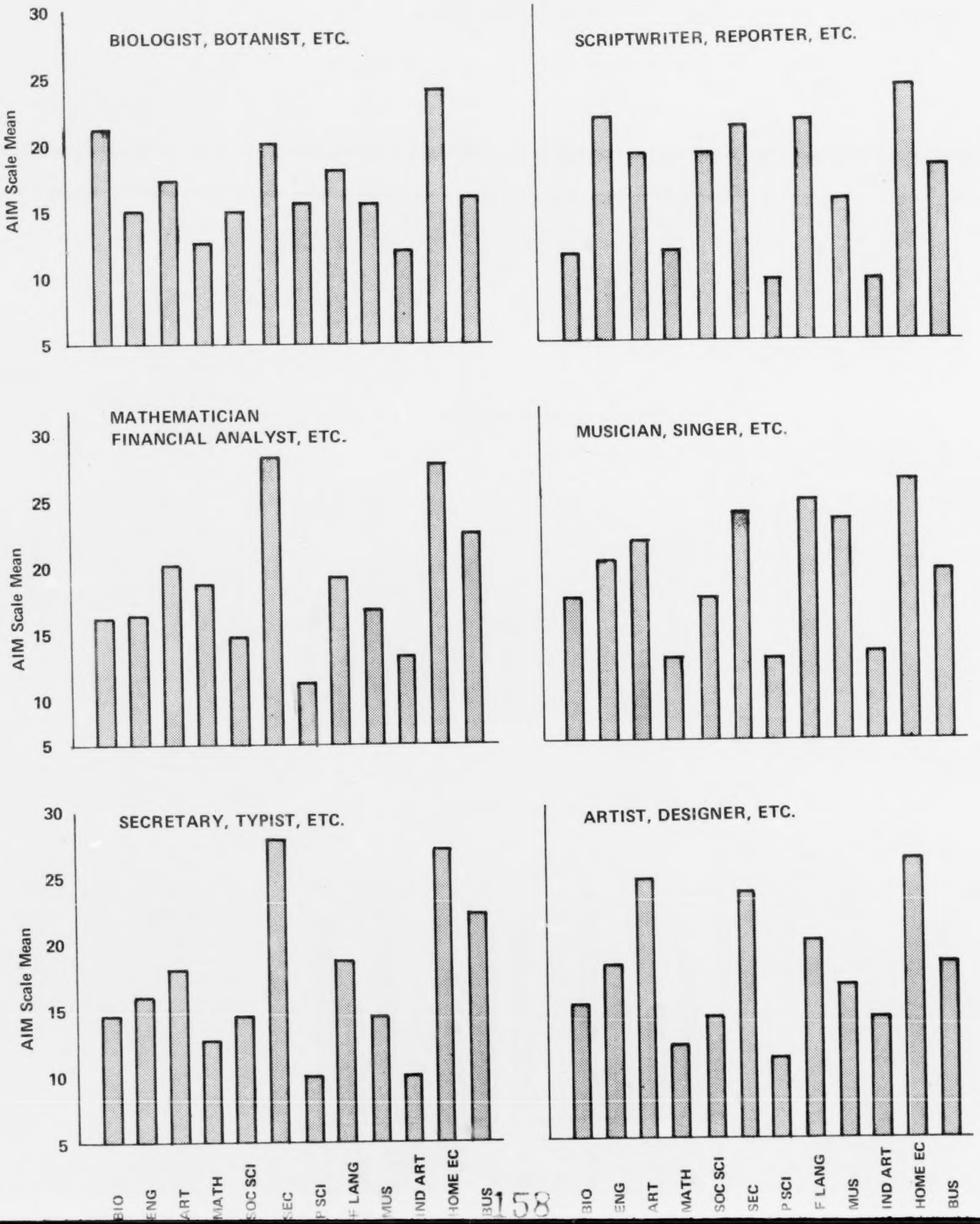

Table IV-14

Correlations between Occupational Interests (Items 18-29) and PSAT and Grade 12 Interests (SI-1)

	MALES											
	Engineer, electrician, etc.	Biologist, botanist, etc.	Script Writer, reporter, etc.	Mathematician, financial analyst, etc.	Buyer, salesman, etc.	Musician, singer, etc.	Home Economist, dietician, etc.	Secretary, typist, etc.	Physicist, chemist, etc.	Translator, teacher, etc.	Sociologist, historian, etc.	Artist, designer, etc.
PSAT-V	-.25	-.00	.15	-.06	-.20	.14	-.11	-.11	.23	.32	.21	.04
PSAT-M	-.09	-.11	-.03	.14	-.10	.03	-.10	-.06	.07	.15	.05	-.07
SI-1 Bio	-.04	.23	.09	.06	.07	.10	.23	.18	.18	.04	.09	.07
Eng	-.22	-.03	.41	.07	.12	.26	.19	.19	.03	.23	.22	.12
Art	-.18	.06	.21	.00	.11	.39	.15	.14	.24	.21	.27	.45
Math	.32	-.16	-.06	.47	.18	-.07	.14	.23	.04	-.01	.01	-.05
Soc Sci	-.07	.05	.33	.10	.07	.13	.14	.24	.02	.26	.46	.05
Sec	.14	.04	.18	.18	.17	.17	.29	.46	-.07	.02	.18	.05
P Sci	.10	.08	.10	.14	.06	.21	.10	.15	.38	.16	.18	.10
F Lang	-.13	.04	.38	.16	.20	.36	.29	.31	.14	.33	.38	.10
Mus	-.28	-.06	.22	.04	.06	.63	.19	.27	.08	.15	.22	.24
Ind Art	.33	.04	-.23	-.05	-.02	-.19	.01	-.06	-.06	-.22	-.11	.03
Home Ec	.00	-.04	.12	.11	.12	.16	.24	.31	-.06	.00	.09	.16
Bus	.07	-.12	.09	.11	.24	.02	.17	.24	.04	.07	.19	.18

Table IV-15

Correlations between Occupational Interests (Items 18-29)

and PSAT and Grade 12 Interests (SI-1)

FEMALES

	Engineer, electrician, etc.	Biologist, botanist, etc.	Script Writer, reporter, etc.	Mathematician, financial analyst, etc.	Buyer, salesman, etc.	Musician, singer, etc.	Home Economist, dietician, etc.	Secretary, typist, etc.	Physicist, chemist, etc.	Translator, teacher, etc.	Sociologist, historian, etc.	Artist, designer, etc.
PSAT-V	-.01	.08	.06	-.12	-.09	.05	-.12	-.27	.06	.15	.19	.08
PSAT-M	.02	.05	-.01	.08	-.09	-.01	-.07	-.27	.05	.08	.04	.01
SI-1 Bio	.14	.32	.00	-.05	-.02	.06	.17	-.08	.30	.06	.08	.08
Eng	.00	.04	.30	-.01	.07	.18	.10	.02	.14	.17	.21	.12
Art	.06	.15	.02	-.04	-.10	.12	-.04	-.10	.13	.12	.10	.43
Math	.08	.01	-.04	.43	.05	-.02	.03	.09	.02	-.06	-.15	-.08
Soc Sci	.03	.10	.16	.03	.11	.10	.08	.04	.10	.14	.23	-.01
Sec	.02	-.04	.08	.19	.25	.00	.11	.55	.01	-.07	-.02	-.16
P Sci	.12	.21	.06	.11	.07	.07	.17	-.04	.30	.08	.18	.05
F Lang	.06	.10	.14	.04	-.01	.16	-.01	.00	.15	.36	.14	.08
Mus	-.06	.03	.08	.02	-.05	.45	.10	.01	.02	.06	.04	.16
Ind Art	.20	.13	-.01	.12	.04	.06	.14	.02	.09	-.01	-.01	.16
Home Ec	.09	.07	.00	.14	.17	.08	.40	.11	.03	-.05	-.04	.02
Bus	.06	-.02	.12	.25	.28	.01	.13	.51	.03	-.05	-.01	-.10

In short, the network of relationships among AIM scores obtained in grade 11, ratings of academic interests at the end of grade 12, and ratings of academic or occupational interests one year after high school graduation suggests that interests seem to occupy a rather well integrated and coherent territory in the individual's self-concept. The findings suggest that the domain of academic interests, as defined by AIM and students' ratings, may be extended to incorporate occupational interests.

V: SUMMARY OF MAJOR FINDINGS

A preceding report (Part I) dealt with the development of the Academic Interest Measures (AIM), the selection of a national sample of high school juniors, the collection of data in fall 1966, and such characteristics of AIM as norms and score distributions, reliabilities, structure of the scales and construct validity.

The present report (Part II), based on data obtained from a follow-up of the original sample through spring 1969, has focused successively on four main topics:

(1) The prediction of marks in grades 12 and 13, emphasizing the contribution of AIM to differential prediction.
(2) The prediction of interests in grades 12 and 13, again with special attention to differential prediction.
(3) The structure of abilities, interests, and values.
(4) The relationships between the independent variables and occupational criteria for the subsample that did not continue with formal education during the year after graduation from high school.

Some incidental attention has also been given to interest score profiles for various intended-major-field and occupational groups. Another incidental analysis showed a marked increase in college attendance, especially among students in the lowest quarter of the 11th-grade population in socioeconomic status, in comparison with Project TALENT data collected six years earlier. Other "survey" data which appear in the body of the report are omitted from this summary of major findings.

To assess the distinctive contribution to prediction made by AIM, a consistent statistical procedure was followed. Multiple correlations were given in a progression that always started with Preliminary Scholastic Aptitude Test scores, Verbal and Mathematical (PSAT-V and PSAT-M), as predictors; then variables from AIM and other predictors were added successively. A major obligation was undertaken to determine the extent to which AIM increased predictive validities when ability scores, and sometimes previous marks, were already available. Finally, the contribution of AIM was compared with that of a simpler rating by students of their own interests in the fields represented by AIM scales.

Prediction of Grade 12 Marks

Interactions were found among academic interests and sex and subject field. Marks for females were more predictable than marks for males, except in the field of music. Eight of 11 course marks for females, but only four of 10 course marks for males, were predicted with a multiple correlation equal to or greater than .50. AIM contributed substantially to the multiple correlation in seven fields for the males, but in only four fields for the females. AIM scales made their most significant contribution to predicting 12th-grade marks in music,art, and biology for males--subjects in which they contributed nothing to prediction for females. AIM *Mathematics*, on the other hand, contributed distinctively to the prediction of girls' (but not boys') marks in mathematics.

Students' own ratings of their interests (SI) in each field, on a simple five-point scale, turned out to be as valid as full AIM scales in contributing to prediction of 12th-grade marks.

Prediction of Grade 13 Marks

Again, marks for females were more predictable than marks for males, although the multiple correlations--compared to grade 12--decreased more sharply for the females. AIM added virtually nothing to the prediction afforded by PSAT for females in any field, and contributed substantially to the prediction for males in only three fields. Even these contributions generally became negligible, however, when previous marks were available as predictors. Once again, student-rated interests were fully as valid as AIM.

Differential Prediction of Marks

AIM made a substantial--and, in some instances, dramatic--contribution to differential prediction of marks obtained in grade 12. High correlations between obtained marks for a pair of courses and/or between predicted marks for a pair of courses tended to keep differential validities generally low. Differential correlations were higher for males than for females in grade 12.

In grade 13, on the other hand, differential correlations were higher for females. This shift was attributed to lower correlations between pairs of obtained course marks and also between pairs of predicted marks for females in grade 13.

The interest measures used as predictors for grade 13 marks included both AIM scores obtained in grade 11 and students' ratings of interests made in grade 12 (SI-1). These interest measures contributed appreciably to the differential correlations, even when 12th-grade marks, as well as PSAT-V and PSAT-M, were used as predictors.

An attempt was made to clarify the nature of differential prediction and to discuss the limits on interpretation imposed by the prevalence of incomplete data (since all students do not take all courses) and of high correlations between criteria.

Prediction of Interests

Interests--as a specific component of satisfaction--were regarded as more appropriate criteria than marks or general ratings of satisfaction for evaluating the usefulness of AIM in prediction. Intercorrelations among global ratings of interest in a subject field, interest in attending classes in that field, interest in doing required reading in that field, and interest in doing other required assignments in that field tended to be quite high. These ratings correlated somewhat lower with satisfaction in the amount learned in the subject field and distinctly lower with satisfaction in grades received in that field.

Correlations between 11th-grade AIM scores and 12th-grade interests in corresponding subjects were quite substantial. PSAT scores added virtually nothing to the magnitude of the multiple correlations. Again, however, the single ratings of interests in 11th-grade (SI) predicted the 12th-grade criteria about as well as AIM. Use of both AIM and SI as predictors increased the multiple correlations in most subject fields, with the median R about .5 for the males and .6 for the females. The highest correlations for both sexes were in mathematics (.64 and .68, respectively). The lowest were in secretarial for males (.34) and industrial arts for females (.37)--predictions which we might dare to suggest are somewhat lacking in salience.

Findings on the prediction of interests for grade 13 were remarkably similar to those for grade 12 in virtually every respect. Again, mathematics was the most predictable field, with a multiple correlation of .60 for males, .69 for females. The 12th-grade interest ratings (SI-1), being more recent than AIM scores, were generally somewhat better predictors of 13th-grade interests. Predictions of interests in grade 13 at two-year colleges were not, for the most part, significantly different from those at four-year colleges.

Differential Prediction of Interests

Interests proved, as expected, to offer a fertile opportunity for differential prediction. Intercorrelations among actual criteria and also among predicted criteria tended to be low, and indeed were often negative, and problems associated with incomplete data were alleviated. In grade 12, the multiple correlations were generally in the range from .3 to .6, with lower differential validities appearing in only three pairs of subject fields for males (again, these pairs seem to lack salience, since they include home economics and secretarial) and two pairs for females.

In grade 13, for a test battery consisting of PSAT-V, PSAT-M, AIM, and SI-1, differential validities were generally in the range from .4 to .6. Poorer differentiation was found for pairs involving the field of education, pairings between applied science and engineering or physical science, and between humanities and social sciences.

Discrimination between Intended-Major-Fields

Profiles of PSAT and AIM means significantly differentiated each intended-major-field group of males at the end of grade 13 from the profile for all groups of grade 13 males combined. A multiple discriminant analysis (carried out for males only) yielded a dimension that was construed as verbal ability and interests *vs.* applied science and mathematics interests for the first discriminant and a scholastic ability and scientific interests *vs.* business interest dimension as the second discriminant. While canonical correlations between linear combinations of all the test scores and group membership were not high (.51, .42, and .32 for the first three discriminants, respectively), joint use of the first two discriminants succeeded in separating a number of the intended-major-field groups from each other. The discriminants made psychological and educational "sense" as far as they went, but many of the groups were left quite undifferentiated, and considerable overlap was found even between groups most widely separated in the discriminant space.

A profile of mean scores of the various intended-major-field groups of males on ratings of the importance of certain occupational values appeared to offer additional differentiation of groups that were not well differentiated in the discriminant space by PSAT and AIM. This unique contribution of values to discriminating between major-field groups was seen as warranting further exploration in future research.

The Structure of Abilities, Interests, and Values

Unrestricted maximum likelihood factor analyses seemed to establish quite clearly the independence of the abilities, interests, and values domains. The factor structure of interests remained remarkably consistent across different measures, across different groups, and across different times. Thus, the structure of interests was very similar whether AIM or students' own ratings of interests were used; whether the group was composed of male or female enrollees in two-year or four-year colleges, or high school graduates who were not enrolled in any educational institution; whether interests were measured in grade 11 or grade 13. Indeed, the interlocking of measures was so tight that there was a closer resemblance between the structures of AIM and 12th-grade ratings of interests than between the structures of 11th-grade and 12th-grade ratings. Findings on the structure of interests were such as to support the use of AIM as a criterion measure, recommended in Part I.

While dimensions in the values domain were not so sharply defined for all groups, the independence of this domain from interests and abilities and its importance in career decision-making were seen to warrant additional research. It was suggested that the relative unfamiliarity of values constructs to students might--unlike the measurement of interests--require greater specificity of items rather than global ratings.

The Nonschool-Going Group

The subsample classified as nonschool-going in the year after graduation from high school turned out to include a high proportion of people who expected to enroll in college during the following year. The nonschool-goers tended to resemble the school-going subsample in ratings of occupational values and educational goals, although somewhat lower in PSAT scores, socioeconomic status, and scores on certain AIM scales.

Follow-up data from this nonschool-going group provided an opportunity to relate the earlier measures of interests to short-term occupational criteria. AIM scores obtained in grade 11 appeared to differentiate groups formed on the basis of occupational interests expressed one year after high school graduation. It was also noted that relationships between AIM scores and expressed occupational interests were very similar to relationships between the latter and ratings of academic interests in grade 12 (SI-1). Thus again, this time in respect to occupational criteria, students' ratings of their own interests "behaved" like AIM. In short, this extension to occupational interests of the network of relationships among AIM scores obtained in grade 11 and ratings of interests in grades 11, 12 and 13 suggested that interests occupy a rather well integrated and coherent territory in individuals' self-concepts. It is perhaps this very integrity and coherence of interests that has made simple ratings of academic interests just as valid predictors as the full AIM scales of every criterion used in the study. For use in prediction, anything AIM can do, SI can do faster. For use as a criterion measure, as recommended in Part I, AIM retains a number of advantages.

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Appendix A

Student Information Form
College Questionnaire
Tell It Like It Is

STUDENT INFORMATION FORM

Directions

Do your interests and aptitudes make a difference in the courses you take, the marks you get, the plans you make? How are interests and aptitudes related? In October 1966 your class took part in a nationwide research study of the Preliminary Scholastic Aptitude Test and the Academic Interest Measures. The purpose of the study is to make these tests more useful to you and other high school students in your educational and occupational planning. To accomplish this, we now need more information about your school work and your plans for the year following high school graduation. We shall then try to reach many of you again to find out how you are getting along.

Please answer all questions on your answer sheet. Do not write on this questionnaire form. For most of the questions you simply mark an "X" in the box that shows which answer you have chosen. This is how you should answer question 4, for example, if you are in the 12th grade:

4.

☐ A
☒ B
☐ C

For a few questions, you will print your answers in the special boxes provided on your answer sheet. Print one letter or number to a box, and leave a box blank where a space would normally appear. Here is an example for question 3:

123 N BROADWAY RD	▨	PRINCETON HTS NJ	▨	08540
Number and Street	▨	City and State	▨	Zip Code

All information will be kept strictly confidential and will be used solely for research purposes.

1. Check the spelling of your name at the top of your answer sheet. If the spelling is incorrect, or if you have changed your name, print in your full name. If no corrections are necessary, leave this question blank.

2. Print the full name of your parent or guardian.

3. Print your permanent home address. Use customary abbreviations.

4. What grade are you in?

    (A) 11th
    (B) 12th
    (C) Other

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5. Which of the following best describes your present course of study?

   (A) Academic or College Preparatory
   (B) Agriculture
   (C) Business or Commercial
   (D) General
   (E) Home Economics
   (F) Vocational or Industrial Arts

6. Which of the following best describes your educational plans during the year after graduating from high school?

   (A) I will definitely continue my education.
   (B) I expect to continue my education but I am not certain.

   (C) I will definitely not continue my education.
   (D) I do not expect to graduate this year.

If you have marked A or B in question 6, go on to question 7.

If you have marked C or D in question 6, skip to question 12.

7. Which of the following best describes the type of school you are likely to attend?

   (A) Four-year (or more) college, university or institute
   (B) Two-year junior or community college
   (C) Technical institute (less than 4-year)
   (D) School of professional nursing (less than 4-year)
   (E) Business or secretarial school (less than 4-year)
   (F) Trade or vocational school or school of practical nursing
   (G) Post-graduate (13th year) high school
   (H) Other

8. How many years of school are typically required to complete your program at the institution that you expect to enter?

   (A) 1 year or less
   (B) 2 years
   (C) 3 years
   (D) 4 years or more

9. Print in the name and address of the school you think you are most likely to be attending in April 1969. Use customary abbreviations.

10. If you are not certain that you will attend the school named in question 9, print in the name and address of the school you think you are second most likely to attend. (If you are certain, leave this question blank.)

11. Where do you plan to live during your first year at school?

   (A) Home
   (B) School dormitory or residence hall
   (C) Fraternity or sorority house
   (D) Off campus, not at home
   (E) Uncertain at this time
   (F) Other

For questions 12-23 you are to record your marks in various subject fields for the semester completed in January 1968 (mid-year marks). Since schools use a variety of marking systems, we would like you to record your marks using a 5-point numerical scale as indicated below. Even if your school uses a different marking system, please use this scale.

Mark your answers as follows:

5...for...A, Excellent
4...for...B, Good
3...for...C, Fair
2...for...D, Pass
1...for...F, Fail

Mark 0 to indicate that you did not take a course in the subject field named. If you took more than one course in any subject field, record your highest mark in that field.

12. English
13. Foreign language
14. Mathematics
15. Biological science
16. Physics or chemistry
17. Social studies, history or geography
18. Music
19. Art
20. Industrial arts
21. Secretarial courses
22. Home economics
23. Bookkeeping or accounting

24. What is your rank in class with respect to all students in your grade? Estimate if necessary.

(A) 1st or top fifth
(B) 2nd fifth
(C) 3rd fifth
(D) 4th fifth
(E) 5th or bottom fifth
(F) Don't know

For questions 25-36 you are to indicate whether you have found courses in various subject fields interesting. If you are not familiar with the subject field named, answer according to whether or not you think you would like to take courses in that field.

Mark your answers as follows:

(A) Very interesting
(B) Somewhat interesting
(C) Neither interesting nor uninteresting
(D) Somewhat uninteresting
(E) Very uninteresting

25. Biology
26. English
27. Art
28. Mathematics
29. Social studies
30. Secretarial
31. Physical sciences
32. Foreign languages
33. Music
34. Industrial arts
35. Home economics
36. Business

37.

Fields of Study

Mathematics
Physical science
Biology
Industrial arts

Distribute 100 points among the four fields of study named above according to how interesting you find (or think you would find) each of them. For example, if you find them equally interesting, or uninteresting, you should distribute your 100 points like this:

Mathematics	25
Physical science	25
Biology	25
Industrial arts	25

or, if you find mathematics of considerable interest, physical science and biology of equal interest but of lesser interest than mathematics, and industrial arts of little interest, you might distribute your 100 points like this:

Mathematics	55
Physical science	20
Biology	20
Industrial arts	5

Notice that they sum to 100.

Take a minute or so to consider how you wish to distribute the 100 points. When you have decided, write on your answer sheet the number of points you wish to allot to each of the fields of study. Check to see that they add up to 100.

COLLEGE QUESTIONNAIRE

Please answer all questions on your answer sheet. Do not write on this questionnaire form. For each question, mark an "X" in the box that shows the answer you have chosen. For example, if you have tentatively decided on a major field of study but are not certain of it, you should answer question 4: 4.
A
☒
C

SECTION A

1. Check the spelling of your name as it appears on the reverse side of your answer sheet. If the spelling is incorrect, or if you have changed your name, print in your full name in the space provided next to question 1 on your answer sheet. If no corrections are necessary, leave this question blank.

2. If your present permanent home address is different from the one on your answer sheet, print in your new permanent home address. If no corrections are necessary, leave this question blank.

3. Which of the following best describes the type of school you are now attending?

   (A) Four-year (or more) college, university, or institute
   (B) Two-year junior or community college
   (C) Technical institute (less than 4-year)
   (D) School of professional nursing (less than 4-year)
   (E) Business or secretarial school (less than 4-year)
   (F) Trade or vocational school or school of practical nursing
   (G) Military school
   (H) Beauty culture school
   (I) Other type school
   (J) Not attending school now

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4. With regard to your major field of study, which of the following best describes your situation?

   (A) Am certain or fairly certain of my major field of study
   (B) Have some idea but am not at all certain of my major field of study
   (C) Have no idea what my major field of study will be

If your answer to question 4 was either A or B, answer questions 5 and 6.

If your answer to question 4 was C, skip to question 7.

5. According to your present plans, what is (or will be) your major field of study? Use the list below to indicate your choice. For example, if your present or intended major field is history, mark an "X" in box D. Mark only one box on your answer sheet.

   (A) Biological Science - anatomy, botany, genetics, biochemistry, etc.
   (B) Physical Science - chemistry, physics, geology, astronomy, etc.
   (C) Mathematics - mathematics, statistics, etc.
   (D) Social Science - history, economics, sociology, psychology, anthropology, etc.
   (E) Humanities - English, journalism, philosophy, foreign languages, etc.
   (F) Art/Architecture - art, architecture, drama, graphic arts, interior decorating, design, music, photography, etc.
   (G) Education - kindergarten, elementary, etc.
   (H) Business - accounting, marketing, management, data processing, real estate, etc.
   (I) Engineering - electrical, civil, mechanical, etc.
   (J) Home Economics/Health/Physical Education - lab technology, dietetics, nursing, etc.
   (K) Agriculture - agronomy, animal husbandry, landscape technology, forestry, etc.
   (L) Applied Science - automotive technology, aviation maintenance, appliance repair, drafting, computer science, etc.
   (M) Religion - religion, ethics, Bible, etc.
   (N) Personal Fields - beauty culture, modeling, etc.

16. Describe your present job (or job that you held longest since graduating from high school) in terms of the job title and typical job activities. Print your answers on your answer sheet.

17. In which of the following does your job best fit?

(A) Medical or laboratory
(B) Secretarial, clerical
(C) Construction worker
(D) Food preparation
(E) Farm worker, gardener, logger
(F) Business machine operator
(G) Small machine equipment operator
(H) Information giving or receiving
(I) Musical, artistic, or entertainment
(J) Machine shop, electrical, or mechanical repair
(K) Bookkeeping, cashiering, accounting
(L) Purchasing, sales, demonstration, checking stock
(M) Fireman, policeman, other protective worker
(N) Factory worker, warehousman, unskilled worker
(O) Dressmaker, tailor, leather worker
(P) None of these

Questions 18 - 29 list groups of occupations. Consider each group as a whole and not any particular job within the group. Rate each group according to how interesting you think you would find the typical work activities in those occupations. Disregard all other aspects of the jobs.

When making your ratings do not consider whether the jobs are realistic career choices.

MARK YOUR ANSWERS AS FOLLOWS:
4......for......Very interesting
3......for......Somewhat interesting
2......for......Kind of dull
1......for......Most boring
0......for......Cannot say

18. Engineer, electrician, technician, appliance repairman, mechanic, carpenter.
19. Biologist, botanist, forest ranger, landscaper, farmer, nurseryman, biology lab aid.
20. Script writer, reporter, technical writer, copywriter, editorial assistant, letter writer.
21. Mathematician, financial analyst, accountant, surveyor, computer programmer, bank teller.
22. Buyer, real estate salesman, office manager, hotel manager, salesman, office clerk.
23. Musician, singer, composer, music teacher.
24. Home economist, dietician, chef, nutritionist, tailor, food server.
25. Secretary, typist, administrative assistant, receptionist, file clerk.
26. Physicist, chemist, geologist, astronomer.
27. Translator, foreign language teacher, work in a foreign country.
28. Sociologist, historian, news analyst, legal investigator.
29. Artist, designer, potter, cartoonist, photographer.

30. In which of the groups listed above (questions 18 - 29) would you like to be working 10 years from now? Record the number of the group on your answer sheet.

31. In which of these groups do you expect to be working 10 years from now?

Questions 32 - 40 list various aspects of a job. Indicate how satisfied you are with ea aspect of your present job. If you are not working now but have worked since graduating from high school, answer with respect to that job. If you have not worked since graduating from high school, skip this set of questions and go on to question 41.

MARK YOUR ANSWERS AS FOLLOWS:
4......for......Very satisfied
3......for......Somewhat satisfied
2......for......Somewhat dissatisfied
1......for......Very dissatisfied
0......for......Cannot say

32. Working conditions
33. Salary
34. Job security
35. Opportunities for advancement
36. Relationships with other workers
37. Typical job activities
38. Opportunities for learning new skills
39. Amount of supervision
40. Opportunities to be creative

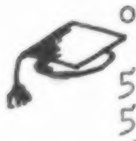
Questions 41 - 52 list some satisfactions or values that people might consider important choosing an occupation. On your answer sheet, write a number from 0 to 10 to show how important each value is to you.

0 1 2 3 4 5 6 7 8 9 10
LOW → HIGH

For example, if money is a quite important value in your choice of an occupation, you mi assign it a scale rating of 8. The number 8 would then be written in the box next to question 41. 41. $\boxed{8}$

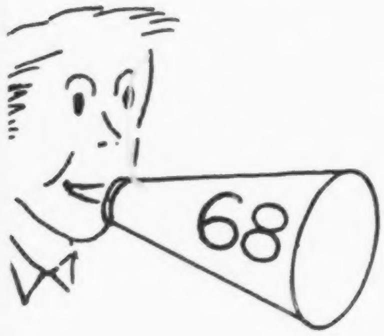
41. Money, income
42. Prestige, looked up to by others
43. Freedom to make decisions
44. Helping others
45. Security, steady work
46. Variety, non-routine work
47. Leadership, responsibility for others
48. Interest in the work activities
49. Leisure time
50. Pleasant working conditions
51. Creativity, expression of ideas
52. Sense of accomplishment, pride in work

Questions 53 - 59 list some possible goals or purposes of education. Rate the importanc of each using the scale 0 - 10 as in question 41 - 52 above.



53. To achieve a broader cultural background
54. To develop the ability for critical thinking
55. To develop leadership skills
56. To prepare for an occupation
57. To develop the ability to get along with people
58. To increase understanding of community and world problems
59. To accept social roles and responsibilities

TELL IT LIKE IT IS.........



What is it like to be a recent high school graduate? What have you found? What are you looking for?

We want to give people who are still in high school the benefit of your experience and opinions. You were chosen, when you were a junior in high school, as part of a national sample. Students now in high school need the information that only you can give. Your replies will be pooled with the replies from the rest of the sample. What you have to offer is too valuable to be lost. Please read the simple directions below, fill out the answer sheet, and mail it back, now.

Directions

Please answer all questions on your answer sheet. Do not write on this questionnaire form. For most questions, mark an "X" in the box that shows the answer you have chosen. For example, if you are working full time you should mark question 1 as shown below:

1. ☒ B C D E F G H I ____________

For a few questions, you are asked to print your answers in the spaces provided on your answer sheet.

All information will be kept strictly confidential and will be used solely for research purposes.

---

1. Which of the following best describes what you are now doing? Mark as many as apply.

   (A) Working full time
   (B) Working part time
   (C) In military service
   ? (D) In apprentice program
   (E) Not employed but seeking employment
   (F) Keeping house
   (G) Attending (or enrolled in) school full time
   (H) Attending (or enrolled in) school part time
   (I) Doing something else (Specify on your answer sheet)

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If you are attending school either full or part time, answer questions 2 and 3. Otherwise skip to question 4.

2. Which of the following best describes the type of school you are now attending? Mark only one.

(A) Four-year (or more) college, university or institute
(B) Two-year junior or community college
(C) Technical institute (less than 4-year)
(D) School of professional nursing (less than 4-year)
(E) Business or secretarial school (less than 4-year)
(F) Trade or vocational school or school of practical nursing
(G) Post-graduate (13th year) high school
(H) Other (Specify on your answer sheet)

3. In the space provided on your answer sheet, print the full name and address of the school you are now attending.

4. Do you plan to return to school during the period June 1969 - June 1970?

(A) Yes, I definitely will (Answer questions 5 - 15)
(B) Maybe I will but I am not sure (Answer questions 5 - 15)
(C) No, I don't think I will (Skip to question 16)

5. Which of the following best describes the type of school you are likely to attend?

(A) Four-year (or more) college, university or institute
(B) Two-year junior or community college
(C) Technical institute (less than 4-year)
(D) School of professional nursing (less than 4-year)
(E) Business or secretarial school (less than 4-year)
(F) Trade or vocational school or school of practical nursing
(G) Post-graduate (13th year) high school
(H) Other (Specify on your answer sheet)

Questions 6 - 15 list sources of financial support while attending school. If you do return to school, indicate how much financial support you are likely to receive from the source named.

MARK YOUR ANSWERS AS FOLLOWS:
2......for......major
1......for......minor
0......for......none

6. Parents, wife or husband, other relatives
7. Working while attending school
8. Personal savings
9. Scholarships or grants from school attended
10. Scholarships or grants from other sources
11. Loans from the National Defense Education Act Loan Fund
12. Loans from college loan funds
13. Loans from banks or other organizations
14. GI Bill, ROTC, or other government assistance
15. Trust fund, insurance plan

6. Using the list provided in question 5, indicate your second choice for a possible major field of study.

7. Which of the following best describes your educational plans for the next academic year?

   (A) Will be enrolled at this school
   (B) Will be enrolled at some other school
   (C) Will not be enrolled at any school

For questions 8-19 you are to record your marks in various subject fields for the semester completed in January 1969 (mid-year marks). Since schools use a variety of marking systems, we would like you to record your marks using a 5-point numerical scale as indicated below. Even if your school uses a different marking system, please use this scale.

Mark your answers as follows:

5...for...A, Excellent
4...for...B, Good
3...for...C, Fair
2...for...D, Pass
1...for...F, Fail

Mark 0 to indicate that you did not take a course in the subject field named. If you took more than one course in any subject field, record your highest mark in that field.

8. Biological Science
9. Physical Science
10. Mathematics
11. Social Science
12. Humanities
13. Art/Architecture
14. Education
15. Business
16. Engineering
17. Home Ec./Health/Phys. Ed.
18. Agriculture
19. Applied Science

For questions 20-31 you are to indicate whether you have found courses in various subject fields interesting. If you are not familiar with the subject named, answer according to whether or not you think you would like to take courses in that field.

Mark your answers as follows:

5...Very interesting
4...Somewhat interesting
3...Neither interesting nor uninteresting
2...Somewhat uninteresting
1...Very uninteresting

20. Biological Science
21. Physical Science
22. Mathematics
23. Social Science
24. Humanities
25. Art/Architecture
26. Education
27. Business
28. Engineering
29. Home Ec./Health/Phys. Ed.
30. Agriculture
31. Applied Science

SECTION B

In answering questions in Section B, consider only coursework taken during your first year at college.

For questions 32-43, rate your degree of interest in attending classes in the subject field named.

Mark as follows:

5...Very interesting
4...Somewhat interesting
3...Neither interesting
nor uninteresting
2...Somewhat uninteresting
1...Very uninteresting

0...No courses taken in
this field

32. Biological Science
33. Physical Science
34. Mathematics
35. Social Sciences
36. Humanities
37. Art/Architecture
38. Education
39. Business
40. Engineering
41. Home Ed./Health/
Phys. Ed.
42. Agriculture
43. Applied Science

For questions 44-55, rate your degree of interest in doing required reading in the subject field named.

Mark as follows:

5...Very interesting
4...Somewhat interesting
3...Neither interesting nor uninteresting
2...Somewhat uninteresting
1...Very uninteresting

0...No courses taken in this field

44. Biological Science
45. Physical Science
46. Mathematics
47. Social Sciences
48. Humanities
49. Art/Architecture
50. Education
51. Business
52. Engineering
53. Home Ec./Health/ Phys. Ed.
54. Agriculture
55. Applied Science

For questions 56-67, rate your degree of interest in doing required assignments (other than reading) - for example, term papers, laboratory reports, etc., in the subject field named.

Mark as follows:

5...Very interesting
4...Somewhat interesting
3...Neither interesting nor uninteresting
2...Somewhat uninteresting
1...Very uninteresting

0...No courses taken in this field

56. Biological Science
57. Physical Science
58. Mathematics
59. Social Sciences
60. Humanities
61. Art/Architecture
62. Education
63. Business
64. Engineering
65. Home Ec./Health/ Phys. Ed.
66. Agriculture
67. Applied Science

For questions 68-79, rate your degree of satisfaction in how much you learned in the subject field named.

Mark as follows:

5...Very much satisfied
4...Somewhat satisfied
3...Neither satisfied
nor dissatisfied
2...Somewhat dissatisfied
1...Very much dissatisfied

0...No courses taken in
this field

68. Biological Science
69. Physical Science
70. Mathematics
71. Social Sciences
72. Humanities
73. Art/Architecture
74. Education
75. Business
76. Engineering
77. Home Ec./Health/
Phys. Ed.
78. Agriculture
79. Applied Science

For questions 80-91, rate your degree of satisfaction in the grades you received in the subject field named.

Mark as follows:

5...Very much satisfied
4...Somewhat satisfied
3...Neither satisfied
nor dissatisfied
2...Somewhat dissatisfied
1...Very much dissatisfied

0...No courses taken in
this field

80. Biological Science
81. Physical Science
82. Mathematics
83. Social Sciences
84. Humanities
85. Art/Architecture
86. Education
87. Business
88. Engineering
89. Home Ec./Health/
Phys. Ed.
90. Agriculture
91. Applied Science

SECTION C

Questions 92-103 list some satisfactions or values that people might consider important in choosing an occupation. On your answer sheet, write a number from 0 to 10 to show how important each value is to you.

0 1 2 3 4 5 6 7 8 9 10

LOW → HIGH

For example, if money is a fairly important value in your choice of an occupation, you might assign it a scale rating of 8. The number 8 would then be written in the box next to question 92: 92. 8

92. Money, income
93. Prestige, looked up to by others
94. Freedom to make decisions
95. Helping others
96. Security, steady work
97. Variety, non-routine work
98. Leadership, responsibility for others
99. Interest in the work activities
100. Leisure time
101. Pleasant working conditions
102. Creativity, expression of ideas
103. Sense of accomplishment, pride in work

Questions 104-110 list some possible goals or purposes of education. Rate the importance of each using the scale 0 - 10 as in questions 92-103 above.

104. To achieve a broad cultural background
105. To develop the ability for critical thinking
106. To develop leadership skills
107. To prepare for an occupation
108. To develop the ability to get along with people
109. To increase understanding of community and world problems
110. To accept social roles and responsibilities

How much of the total amount of money that you spent to attend school during the period June 1968 through to the present has come from each of the sources named in questions 110-119? Estimate to the nearest 10 percent. For example, if your parents were your major means of support and you contributed some money earned by working on weekends, you might answer this set of questions:

111.	112.	113.	114.	....	120.
90	10	0	0	....	0

111. Parents, wife or husband, other relatives
112. Working while attending school
113. Personal savings
114. Scholarships or grants from school attended
115. Scholarships or grants from other sources
116. Loans from the National Defense Education Act Loan Fund
117. Loans from college loan funds
118. Loan banks or other organizations
119. GI Bill, ROTC, or other government assistance
120. Trust fund, insurance plan

COMMENTS

If you have any comments, suggestions, or questions regarding this questionnaire or any part of the PSAT-AIM research, we would be happy to hear from you. Use the reverse side of the answer sheet for this purpose.

When you have finished marking your answers, kindly return the answer sheet in the enclosed prepaid envelope.